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ABSTRACT

The document provides a collection of curriculum ideas and suggestions for teaching gifted and talented students, with emphasis on self-directed learning and differentiation of the curriculum. Section I outlines steps for developing a self-directed learning environment and includes resource materials lists and sample evaluation sheets. Among topics covered in a section on developing programs are the following: program goals and prototypes, teaching/learning models, principles of curriculum for the gifted/talented, development of creativity, teacher qualifications, and evaluation of gifted programs. A final section (which makes up the bulk of the document) contains reprints of articles on the following activities: making/recycling paper, weather report/setting up a weather station, the museum you live in/architecture, tracing your own roots, looking at the future, metric measuring, newspaper math, creativity and old time radio/sound effects, paper bag skeletons, holiday activities, and discussion topics. (SBH)

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GIFTED/TALENTED

Curriculum Bulletin No. 2

Differentiating

December 1977

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TABLE OF CONTENTS

SECTION ONE: DEVELOPING SELF-DIRECTED LEARNERS..... 1

SECTION TWO: DEVELOPING PROGRAMS..... 27

SECTION THREE: DIFFERENTIATING THE CURRICULUM IN TERMS OF CONTENT, PROCESS, AND PRODUCT..... 45

Content - Topics:

Making Paper/Recycling Paper....46

Weather Report/Setting Up A Weather Station.....54

The Museum You Live In/Architecture.....76

Tracing Your Own Roots.....90

Looking At The Future.....96

Metric Measuring.....100

Newspaper Math.....104

Creativity and Old-Time Radio/ Sound Effects.....106

Paper Bag Skeletons.....111

Holiday Activities.....115

Discussion Topics.....118

Process - MORE ANALYSIS SKILLS.....131

Product - A WORD ABOUT PRODUCT.....137

DEVELOPING SELF-DIRECTED LEARNERS

The information on the following pages was provided by Dr. Donald Treffinger of the University of Kansas and Ms. Jaclyn Huber, a doctoral student whose research project is in the area of self-directed learning.

Both Dr. Treffinger and Ms. Huber are proponents of individualized creative learning; however, they strongly reject the movement from the traditional or command style of instruction to an open classroom-type instructional model in one step. Neither do they accept the open classroom model as self-directed learning necessarily.

A self-directed learner is one who makes decisions on subject matter, quality and quantity of material, time factors, evaluation of project or learned material, and method of communicating results to others. A self-directed learner is one who directs his or her own learning. We as adults do this all the time. So do many gifted children, usually outside of the school setting.

In order to develop a self-directed learning environment at school, seven steps or periods must be followed in order, with each period lasting a minimum of four weeks. The next period is not attempted until both the teacher and the students are ready. The process must be explained to the class, and discussion before, during, and after each period is an integral part of the process. The teacher and the class together decide when the next step is to be attempted.

Briefly, the seven periods can be described as follows:

I.	COMMAND STYLE	Teaching/Learning is Totally Teacher-Directed
II.	TASK STYLE	Teacher Prescribes/Learner Selects from Options Provided
III.	RECIPROCAL STYLE	Teacher Pairs Learners as Partners/ Learners Function in Teacher-Student Relationship Covering Material and Skills Chosen by Teacher
IV.	INDIVIDUAL PROGRAM: TEACHER DESIGNED	Teacher Assesses Learner Needs and Designs Individualized Program/ Learner Makes Choices from Options
V.	GUIDED DISCOVERY	Learner Chooses Project Areas/ Teacher Provides Resources and Functions as Consultant
VI.	PROBLEM SOLVING	Learner Chooses Problems to be Solved/Teacher Provides Resources and is a Facilitator
VII.	INDIVIDUAL PROGRAM: STUDENT DESIGNED	Learner Assesses Own Needs and Designs Own Program/ Learner Makes Decisions about Subject Matter, Quality and Quantity of Work, Time, Evaluation of Material, Communication of Results to Others

On the following pages, five of the seven steps are described in great detail. Resource materials and evaluation sheets are included.

GENERAL GOALS FOR SELF-DIRECTED LEARNING

1. Learning to function more effectively in one's total environment (classroom, school, home, and community) with peers, teachers, parents, and other adults.

2. Learning to make choices and decisions based on self-knowledge of needs and interests.

3. Learning to assume responsibility for choices and decisions by completing all activities at a satisfactory level of achievement and in an acceptable time frame.

4. Learning to define problems and to determine a course of action for their solution.

5. Learning to evaluate one's own work and being able to answer the question, "How well can I do what I want to do?".

Self - directed Learning is NOT:

Random or disorganized

"Unstructured"

Learning alone, at the expense of social outcomes

"Selfish"

Variation only in the rate or pace of instruction

Unconcerned with evaluation

Totally spontaneous

Simply selection of activities for students to do.

A CREATIVE LEARNING PROCESS INVOLVES:

* INVOLVEMENT in meaningful projects;

* CURIOSITY and wanting to know;

* DIAGNOSING a difficulty (by integrating known information, forming new combinations, or identifying gaps);

* ELABORATING and DIVERGING (Seeing new alternatives and finding new possibilities);

* JUDGING, checking, evaluating, and testing possibilities;

* DISCARDING useless, erroneous, unpromising solutions;

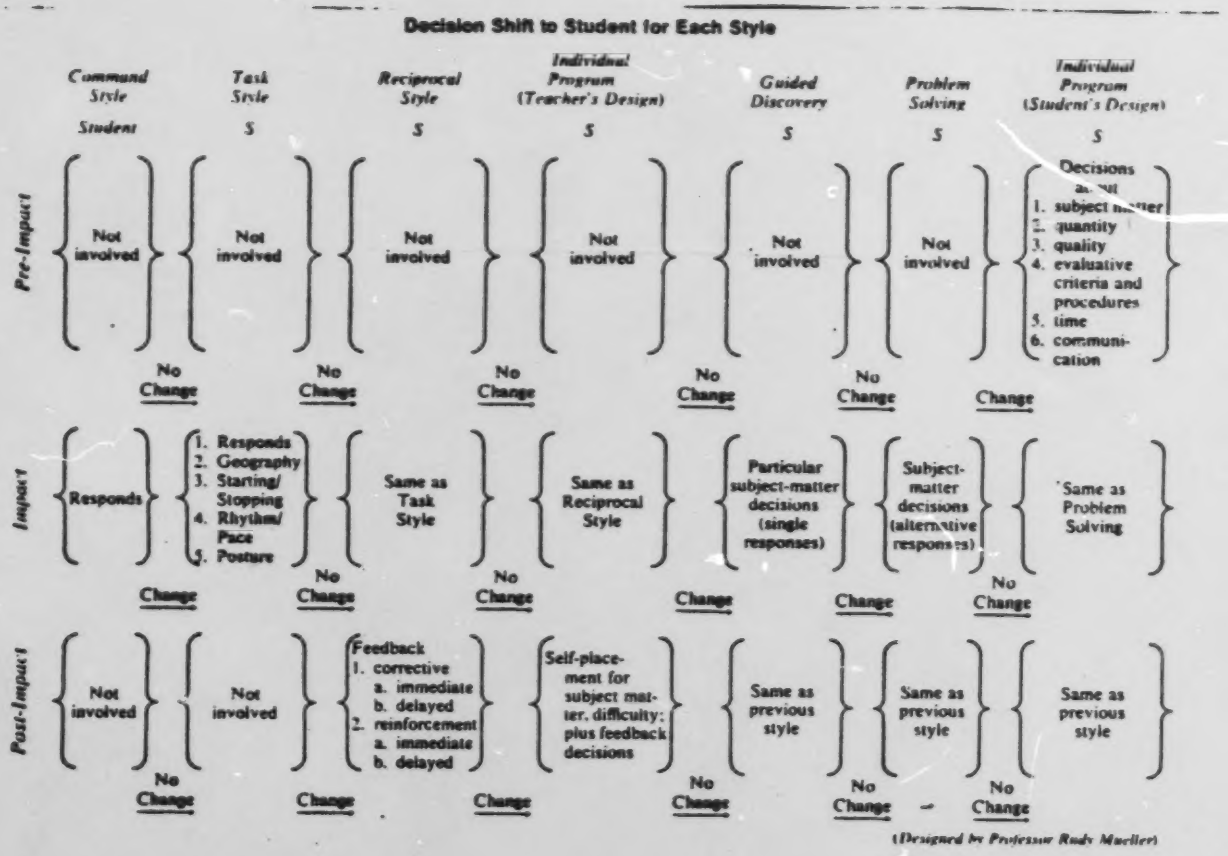
* CHOOSING promising solutions and refining them;

* COMMUNICATING the results to others.

[Source: Torrance, E. P. & Myers, R. Creative learning and teaching. New York: Dodd, Mead & Co., 1970.]

FIGURE 2

COMMAND TO DISCOVERY MODEL[4]



[4] Ibid., p. 173.

B. MODEL FOR DEVELOPING A SELF-DIRECTED LEARNER

	Goals and Objectives	Assess Entering Behavior	Instructional Procedures	Evaluation
I. Command Style	Teacher prescribes for class or for individual pupils	Teacher tests and makes specific curricular decisions-class prescription or individual prescription	Teacher presents curriculum, provides exercises and activities, arrange and supervise practice.	Teacher implements evaluation and assigns grades.
II. Task Style	Teacher prescribes for class and for individual students	Teacher diagnoses and devises several options for students	Learner selects activity or exercise from options provided by teacher.	Teacher relates exercise or activity to objective. Allows student response and reaction without pressure of grades. Activities to be self-checking
III. Reciprocal Style	Teacher paired partners - teacher selects goal or objective for teacher-partner based on Lang. Arts CRT test results.	Teacher allows teacher-partner several options for completing objectives.	Students select activity to be used reciprocally in teacher-student partnership based on agreed criteria	Teacher-partner pair evaluate each others performance based on previously accepted criteria based on Lang Art diagnostic test results.
IV. Individual Program: Teacher Designed	Teacher involves student in creating options	Teacher and student diagnose areas of concern for student	Teacher provides resources and options - Student makes choice of activity - Proceeds at own pace and develops own scope and sequence.	Learner evaluates his own ability in relation to subject matter demands made by teacher
V. Guided Discovery	Learner chooses area for major project. Teacher provides resources	Learner controls diagnoses - Consults teacher for guidance when unclear about needs.	Learner defines projects - Decides on activities, etc. Teacher consults	Learner evaluates his degree of success

1

GOAL ONE

LEARNING HOW TO FUNCTION IN THE TOTAL ENVIRONMENT OF CLASSROOM, SCHOOL, HOME AND COMMUNITY, WITH PEERS, TEACHERS, PARENTS AND OTHER ADULTS.

1. COMMAND TO TASK

TEACHER PROCEDURES

1. Large group discussion - class meeting - to define coming situations involving self-responsibility and freedom.
2. Students regrouped - color coded to facilitate use of activity centers placed around room.
3. Students may work in pairs within groupings.
4. Students control time (20-30 minutes), later (45-60 minutes).
5. Students given free movement of room.
6. Students allowed free interaction.
7. Small group - evaluate two weeks progress.
8. Introduction to learning center - study skills.
9. Students allowed free movement to centers.
10. Students assigned days to work at centers based on color coding.
11. Instructor and class set time for center work to be completed.
12. Instructor sets tone for each day by discussing options available.

STUDENT BEHAVIORS

1. Participates in large group discussion.
2. Moves to activity centers from color groupings.
3. Work in pairs on activities.
4. Controls use of time (20-30 minutes) later (45-60 minutes).
5. Moves freely about room as needed.
6. Interacts freely with peers.
7. Moves freely to centers, to hall, to library.
8. Works independently or with others on learning center activities.
9. Participates in small group evaluation of environmental changes.
10. Moves from center to center as assigned to accomodate all students.
11. Completes center work at own pace but within agreed upon time limit.
12. Responsible for all his/her behavior.
13. Returns materials to proper location.
14. Cleans work areas properly.

2. TASK TO RECIPROCAL

TEACHER PROCEDURES

1. Large group discussion - types of roles set stage for Reciprocal Style. Evaluate past weeks performance.
2. Instructor pairs students for Teacher-Partner. Selection made on basis of strengths, needs and compatability. CRT test is used as diagnostic tool to determine strengths and needs.
3. Instructor provides multiple resources for student use - small centers - one for each skill covered in CRT test.
4. Small group discussion - compatability of partners, work progress and evaluation - partners not in same group.
5. Partners may move to a suitable location as needed.
6. Small group - evaluate teacher-partner (Reciprocal Style).

STUDENT BEHAVIORS

1. Participates in discussion - roles he/she plays - evaluates past weeks work.
2. Works through activities in teacher-partner pairs - reverse roles as needed.
3. Learner, as teacher, selects from resources provided, those materials most workable for his purpose as teacher.
4. Devises own materials as needed.
5. Demonstrates responsibility in freedom of environment.
6. Bothers others less.
7. Active independently - motivated.
8. Selects own materials.
9. Seeks help from others as easily as instructor.
10. Accepting of other work and ideas.
11. Interested in others opinions.
12. Shows consideration for instructor's time.

3. RECIPROCAL TO INDIVIDUAL

TEACHER PROCEDURES

1. Students given complete freedom of building, grounds and resource areas - at school and elsewhere.
2. Students allowed freedom to use staff as needed.
3. Instructor provides variety of learning packets and centers for student use.
4. Instructor and class decide finish date.
5. Instructor provides options to work independently, in pairs or small groups.

STUDENT BEHAVIORS

1. Moves freely about school area and elsewhere to pursue own work.
2. Seeks assistance from anyone.
3. Makes choices from multiple options.
4. Uses class contract to schedule time of completion - daily work at own discretion.
5. Copes with deadline pressures.

4. INDIVIDUAL TO GUIDED DISCOVERY

TEACHER PROCEDURES

1. Instructor provides contract to assist students in defining objectives for Guided Discovery - helps student to structure learning experiences.
2. Instructor allows students complete control of environment - however, desks may be arranged in pairs to give visual structure to room and assist in discipline.
3. Instructor allows student to decide on completion date.
4. Instructor encourages student use of community and city resources.

STUDENT BEHAVIORS

1. Completes contract to his/her satisfaction.
2. Demonstrates responsible behavior in complete control of environment.
3. Completes work on own time schedule.
4. Utilizes all resources.
5. Utilizes home, community and city resources.

2

GOAL TWO

LEARNING TO MAKE CHOICES AND DECISIONS BASED ON SELF KNOWLEDGE OF NEEDS AND INTERESTS.

1. COMMAND TO TASK

TEACHER PROCEDURES

1. Student provided choice of 3 activities to meet objective for review of LA skill. (easy, med., diff.)
2. Student must achieve 85% level of proficiency on skill review.
3. One skill introduced for review each day until review was completed.
4. Introduce Study Skills learning center - student makes choices to complete objectives of center and pass test with 90%.
5. Instructor assists individual students in making decisions - is available for planning.

STUDENT BEHAVIORS

1. Begins making choices involving skill review - selects his/her own activities.
2. Completes activities at own rate.
3. Achieves 85% level before passing to next skill.
4. Selects activities in Study Skills center to complete objectives.
5. Passes Study Skills test with 90%.
6. Confers with instructor in making choices - plans.

3. TASK TO RECIPROCAL

1. Instructor provides teacher-learner pair, directions for teacher behaviors and learner behaviors.
2. Decisions of skills to be learned made from CRT test results.
3. Instructor provides multiple resources from which learner may select materials to meet needs of partner.
4. Instructor consults with teacher - learner pairs as needed - helps to keep goal foremost in mind.
5. Instructor gives students complete control of time.

1. Demonstrates behaviors as both teacher and learner as suggested by supplied list.
2. As teacher, decides what activities would be suitable to teach partner skill needed as per CRT test.
3. Selects proper materials to teach skill or devises own.
4. Keeps accurate record of partner's progress.
5. Helps partner to learn skills needed.
6. Controls time and writes own completion contract.
7. Completes activities to partner's satisfaction.
8. Works willingly in pairs or independently.
9. Demonstrates less trouble in making choices.

3. RECIPROCAL TO INDIVIDUAL

1. Instructor provides multiple learning packets and learning centers for student use. Packets contain several objectives to be met and multiple activities to meet them from which the student can make his/her own choice.
2. Instructor provides 3-4 options of possible packets or centers - based on individual student needs - all content areas.
3. Instructor assists student in decision making concerning content area selected.
4. Instructor meets with individual students to check work progress at regular intervals.

1. Makes choices from options presented by instructor - those areas which interest him/her most.
2. Chooses activities to meet stated objectives and contracts to complete them.
3. Confers with instructor on progress at regular intervals.
4. Decides when objectives have been met.
5. Presents final work to class.
6. Copes with deadline pressures.

4. INDIVIDUAL TO GUIDED DISCOVERY

1. Instructor operates as a facilitator, resource person and consultant.
2. Instructor is supportive of all student decision making.

1. Shows responsibility in completely controlling decision making.
2. Sets own objectives on subject of interest to his/her.
3. Creates own options to meet objectives.
4. Demonstrates ability to explain why objectives were set and of what value learning them has been to him.

3

GOAL THREE

LEARNING TO ASSUME RESPONSIBILITY FOR CHOICES AND DECISIONS BY COMPLETING ALL ACTIVITIES AT A SATISFACTORY LEVEL OF ACHIEVEMENT IN AN ACCEPTABLE TIME FRAME.

TEACHER PROCEDURES
STUDENT BEHAVIORS
1. COMMAND TO TASK
1. Students supplied notebook for record keeping.
2. Students write letter to themselves listing coming responsibilities and how they intend to meet them.
3. Students keep daily log of activities selected and time spent completing them.
4. Students complete activities on own time schedule - within framework set by instructor.
5. Instructor provides 'just for fun' activities to be used when other work is completed.
6. Instructor provides games that teach for use when other work has been completed.
7. Students may create their own activity sheets and games for others.
8. Instructor introduces small group or individual activities as preparation for center work.
9. Instructor confers with students on completed work.
10. Culmination days provided where all completed projects are presented to class.
1. Makes notebook his own by organizing in his own way.
2. Writes letter to himself/herself listing responsibilities in coming program.
3. Keeps daily log as to activities chosen, completed, and time spent.
4. Completes activities on own schedule.
5. Selects 'just for fun' activities or games to play when other work has been completed.
6. Shows ability to keep busy.
7. Creates activities and games for use by others.
8. Selects to work independently or with others.
9. Makes contract for work and its completion.
10. Keeps track of all work in notebook for conference with instructor.
11. Presents completed activities as per contract.
12. Shows common sense to renegotiate contract when necessary.
2. TASK TO RECIPROCAL
1. Instructor provides new contracts, logs and work evaluation sheets for new style.
2. Instructor meets with partners to check work progress.
3. Instructor meets with individual students as the need arises.
4. Instructor regroups if need arises.
1. Organizes notebook for new work - log, contract and evaluation sheets.
2. Keeps accurate records of activity sheets, time spent as teacher and as learner.
3. Completes contract of skills to be covered and time needed.
4. Completes work as assigned by teacher partner in time contracted.
5. Does not need constant reinforcement.
6. Asks for more time during school to work on projects - recess, after school, other scheduled times.
3. RECIPROCAL TO INDIVIDUAL
1. Instructor provides new logs, contract and evaluation sheets for new style.
2. Instructor meets with individual student to assess progress at regular intervals.
3. Instructor provides assistance in locating resources if necessary.
4. Instructor explores creative possibilities open to students in designing their own activities to meet selected objectives.
5. Instructor provides time for student to present completed activities to class.
1. Organizes record keeping materials for new activities.
2. Keeps accurate records of activities, plans and progress.
3. Confers with instructor at regular intervals - progress checks.
4. Creates own activities to meet selected objectives.
5. Decides when objectives have been met.
6. Carries activities to completion.
7. Shares resulting projects with class.
4. INDIVIDUAL TO GUIDED DISCOVERY
1. Instructor provides new logs, contracts and evaluation sheets for Guided Discovery style.
2. Instructor assists students in any way necessary as facilitator, counselor and resource.
3. Instructor explores, with class, varied ways of presenting completed projects.
1. Organizes record keeping materials for new style.
2. Keeps records of time, plans and progress without reminders.
3. Completes his/her activities in his/her own learning style.
4. Utilizes varied methods of presentation for completed activities.

4

GOAL FOUR

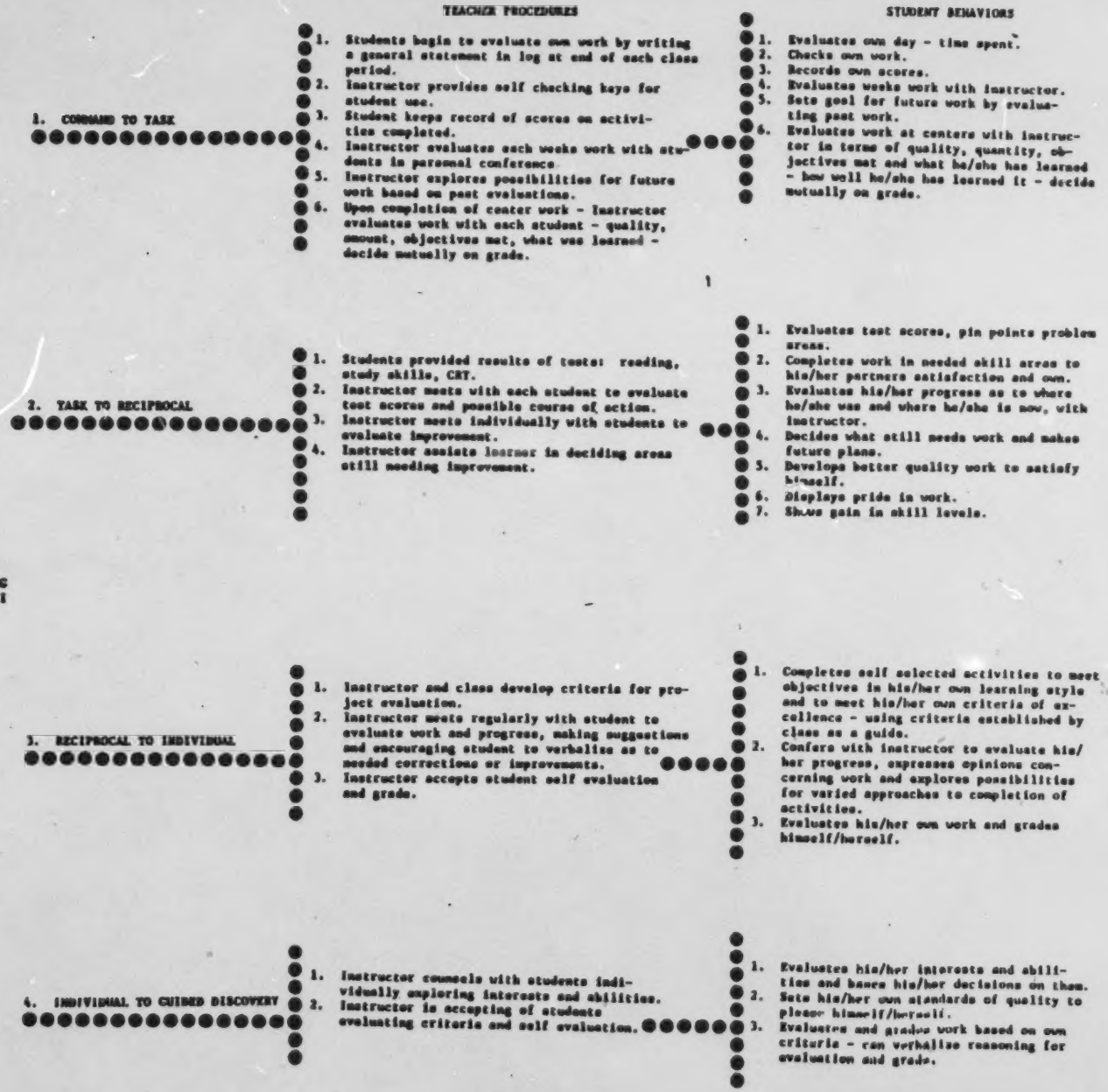
LEARNING TO DEFINE PROBLEMS AND TO DETERMINE A COURSE OF ACTION FOR THEIR SOLUTION.

	TEACHER PROCEDURES	STUDENT BEHAVIORS
1. COMMAND TO TASK	1. Student provided necessary materials for skill review - independently, with partner or with teacher as he/she feels needs to - source provided by instructor. 2. Instructor available for conference on any problems encountered in basic skill understanding. 3. Proficiency tests on review skills passed with 85%. 4. Centers provide students with varied activities to meet same objective. 5. Instructor counsels with student on possible ways of meeting objectives - explaining problem areas. 6. Post test on study skills given as group test after completion of center.	1. Reviews material for skill review independently, with partner or instructor. 2. Confers with instructor on basic problems of understanding. 3. Demonstrates ability to explore areas he/she is not sure of. 4. Passes skills review with 85%. 5. Selects from options given at centers activities to meet objectives. 6. Uses instructor as counselor - conferring with him/her on possible activities to meet objectives. 7. Openly discusses problem areas and possible solutions. 8. Passes post test over study skills at 90%.
2. TASK TO RECIPROCAL	1. Instructor provides student with test scores pinpointing problem areas. 2. Instructor provides resources to meet student needs for skill area practice. 3. Instructor available for consultation on problem areas.	1. Can select skill areas needing review - with student partner, as teacher. 2. Selects materials from resources to provide practice for his/her student partner. 3. Improves needed skill areas to satisfaction of both partners (uses pre-defined criteria). 4. Consults with instructor on possible solutions to defined problems. 5. Completes work with partner in needed skill area. 6. Works through projects to end. 7. Is able to collect and organize materials for particular problem.
3. RECIPROCAL TO INDIVIDUAL	1. Instructor allows student complete freedom to complete activities selected in his/her own learning style. 2. Instructor provides necessary support to student in assisting him/her to work through his/her own problems in own learning style.	1. Can define and redefine problems in carrying out activities based on his/her decisions. 2. Explores possible solutions and approaches to problems. 3. Collects data about problem to prepare for solution. 4. Can see more than one solution to problem.
4. INDIVIDUAL TO GUIDED DISCOVERY	1. Instructor allows student complete freedom in solving his/her problems-non-interference. 2. Instructor provides necessary support and council in assisting him/her to work through problems in his/her own particular fashion..	1. Utilizes all behaviors from previous styles in solving problems. 2. Begins to develop his own problem solving style. 3. Exhibits complete freedom in solving problems - can verbalize how he/she will attack a problem.

5

GOAL FIVE

LEARNING TO EVALUATE ONE'S OWN WORK AND BEING ABLE TO ANSWER THE QUESTION: "HOW WELL CAN I DO WHAT I WANT TO DO?"


TEACHER PROCEDURES
STUDENT BEHAVIORS
1. COMMAND TO TASK
1. Students begin to evaluate own work by writing a general statement in log at end of each class period.
2. Instructor provides self checking keys for student use.
3. Student keeps record of scores on activities completed.
4. Instructor evaluates each weeks work with students in personal conference.
5. Instructor explores possibilities for future work based on past evaluations.
6. Upon completion of center work - Instructor evaluates work with each student - quality, amount, objectives met, what was learned - decide mutually on grade.
1. Evaluates own day - time spent.
2. Checks own work.
3. Records own scores.
4. Evaluates weeks work with instructor.
5. Sets goal for future work by evaluating past work.
6. Evaluates work at centers with instructor in terms of quality, quantity, objectives met and what he/she has learned - how well he/she has learned it - decide mutually on grade.
2. TASK TO RECIPROCAL
1. Students provided results of tests: reading, study skills, CRT.
2. Instructor meets with each student to evaluate test scores and possible course of action.
3. Instructor meets individually with students to evaluate improvement.
4. Instructor assists learner in deciding areas still needing improvement.
1. Evaluates test scores, pin points problem areas.
2. Completes work in needed skill areas to his/her partners satisfaction and own.
3. Evaluates his/her progress as to where he/she was and where he/she is now, with instructor.
4. Decides what still needs work and makes future plans.
5. Develops better quality work to satisfy himself.
6. Displays pride in work.
7. Shows gain in skill levels.
3. RECIPROCAL TO INDIVIDUAL
1. Instructor and class develop criteria for project evaluation.
2. Instructor meets regularly with student to evaluate work and progress, making suggestions and encouraging student to verbalize as to needed corrections or improvements.
3. Instructor accepts student self evaluation and grade.
1. Completes self selected activities to meet objectives in his/her own learning style and to meet his/her own criteria of excellence - using criteria established by class as a guide.
2. Confers with instructor to evaluate his/her progress, expresses opinions concerning work and explores possibilities for varied approaches to completion of activities.
3. Evaluates his/her own work and grades himself/herself.
4. INDIVIDUAL TO GUIDED DISCOVERY
1. Instructor counsels with students individually exploring interests and abilities.
2. Instructor is accepting of students evaluating criteria and self evaluation.
1. Evaluates his/her interests and abilities and bases his/her decisions on them.
2. Sets his/her own standards of quality to please himself/herself.
3. Evaluates and grades work based on own criteria - can verbalize reasoning for evaluation and grade.

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WORK RECORD SHEET

NAME _____

DAY	DATE	ACTIVITY (describe)	HOW WELL I DID	SCORE
MONDAY				
TUESDAY				
WEDNESDAY				
THURSDAY				
FRIDAY				

INDEPENDENT STUDY LOG

NAME _____

Date	What I Did	How I Worked	What I Need To Do Next

Things to remember

Comments

Library Workshop - Contract

I have selected to complete the following activities in the Library Workshop:

1. Book_____

2. Activity_____

3. Materials I will need_____

_____

_____

_____

4. Activity selected - Station #3_____

_____

_____

_____

I plan to have the above activities completed by_____

_____

Signature

_____

LOG OF MY LIBRARY WORKSHOP TIME

Date	Activity worked on	How well did I do?	My next step

Complete your log after each period spent in the workshop.

Name_____

NAME_____

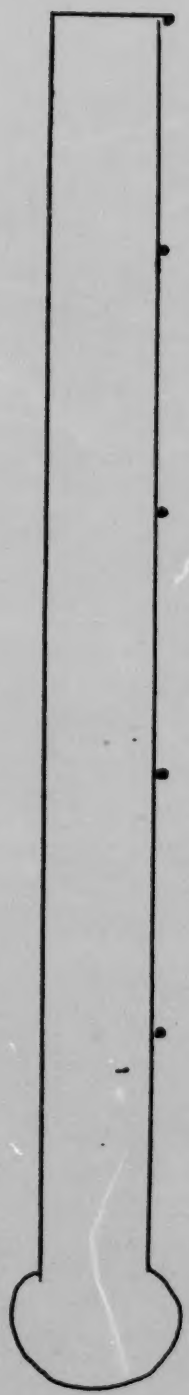
I have shared my project with others

I have evaluated my project

I have finished making my project

I have collected my information and materials

I have made a choice of book and activity



INDEPENDENT STUDY THERMOMETER

DIRECTIONS FOR PARTNERS

During the next two weeks, there will be a time when you will each be a teacher-partner and student-partner. Each of these roles will have certain requirements. Below are listed several things you will need to keep in mind when you are the teacher-partner.

1. Know exactly what your student needs to learn to do and create lessons to help him do so.
2. Decide how many items he or she should be able to do correctly to have learned the skill.
3. Watch and observe as lessons are done so that you know what he or she needs to understand better.
4. Compare each day's lesson with the last lessons to see if improvement is being made.
5. When you feel the necessary skill has been learned, let your student-partner know.

As the student-partner you should remember:

1. Your teacher-partner is there to help you improve your language skills.
2. Be sure to ask questions of your teacher-partner when you do not understand.
3. Remember, you will also be a teacher-partner, so be as cooperative as you can, and work to the best of your ability.

CONTRACT

Name_____

Date_____

Skills I Plan to Improve:

_____

_____

_____

_____

_____

_____

_____

My own evaluation of my work: _____

_____

_____

_____

_____

My student teachers evaluation of my work:_____

_____

_____

Signed:

Student_____

Student - Teacher_____

Guided Discovery

Name_____

Date_____

LEARNING CONTRACT

1. Choose a topic that interests you and one that you would like to do an in-depth study of.

2. Try to explain what you expect to gain by learning this. What's the personal benefits of spending your time on this subject?

3. List below as many strategies (ways, methods, activities) which you might employ in order to learn what you have chosen. Put a star (*) next to the ways which seem best or most pleasant to you.

4. Is there some kind of product which you can produce which might be a good way of ending your study (a paper, play, painting, poem, lesson you would teach, etc.). Could you share your learning in some way with others in the class? List below.

5. In our school we have to give each student a grade at the end of each "marking period." In order to make this more fair, you can help by suggesting below some criteria (standards) by which the teacher will be able to treat your learning. The teacher will help with this.

   Indicate what specific things the teacher should look for. Also, indicate what combination of things will earn an "A", a "B", etc.

6. Some people work best when they have a deadline, and others work best without one. Which pleases you most?

   If you wish a deadline, set one here_____

   What penalties, if any, should there be if you do not meet your deadline?

7. Comments:

Student's Signature_____ Date_____

Teacher's Signature_____

Student Evaluation of Self-Directed Learner Study

May 27, 1976

A. Check as many of the following items as you enjoyed doing this semester. Think before you answer.

( ) 1. Making my own choices
( ) 2. Keeping my own records
( ) 3. Knowing my abilities from my test scores
( ) 4. Writing my own objectives
( ) 5. Working with someone else
( ) 6. Working by myself
( ) 7. Planning with a group
( ) 8. Working where I need to work
( ) 9. Gathering my own materials and information
( ) 10. Deciding my own grade
( ) 11. Helping a friend with his work
( ) 12. Teaching another student skills I know
( ) 13. Doing something I'm interested in doing
( ) 14. Doing something different from my friends
( ) 15. Reporting on my activities to the class
( ) 16. Discussing my work with Mrs. Kasch
( ) 17. Talking about my projects to my parents
( ) 18. Displaying my work in the room
( ) 19. Using the library
( ) 20. Using the AV equipment
( ) 21. Interviewing interesting people
( ) 22. Working on activities at home
( ) 23. Working on activities away from school
( ) 24. Learning how to put together projects for presentation
( ) 25. Planning my own activities to meet my objectives

B. When I evaluate my own work, I_____

( ) 1. tend to be too easy on myself.
( ) 2. tend to be too critical of myself.
( ) 3. try to decide if this is the best work I can do.
( ) 4. decide how much time I spent on the work.
( ) 5. decide if I used my time wisely.
( ) 6. tried to think how Mrs. Kasch would evaluate my work.
( ) 7. try to get by with less than I usually do if Mrs. Kasch is grading.
( ) 8. compare my work to my friend's work.
( ) 9. find it easy to grade my own work.
( ) 10. find it hard to grade my own work.
( ) 11. worry about what grade my parents expect.
( ) 12. try to satisfy myself and not others.

C. I have learned to do the following things better this semester:

( ) 1. Make choices and decisions

( ) 2. Write reports
( ) 3. Work with charts and graphs
( ) 4. Find resource materials
( ) 5. Use the library and AV equipment
( ) 6. Put materials together in presentations for others
( ) 7. Interview people and write up the interview
( ) 8. Budget my own time
( ) 9. Improve my language skills
( ) 10. Improve my reading skills
( ) 11. Improve my spelling
( ) 12. Take responsibility for my own work
( ) 13. Improve the quality of my work
( ) 14. To know when I have done the best job I can do
( ) 15. Work with others on projects
( ) 16. Work alone without constant help from the teacher
( ) 17. Work alone without help from my parents
( ) 18. Enjoy school
( ) 19. Know myself and how much I can do
( ) 20. Be happier with myself about my school work

D. If there was one thing I did not enjoy doing this semester, it would have to be_____

_____

Signature

_____

STUDENT SELF-DIRECTION OBSERVATIONAL FORM

	1	2	3	4	5	6	7	8	9	10	T	T
A. Pupil Work-Individual:												
1. Reads independently												
2. Works on worksheet												
3. Checks and evaluates work												
4. Takes individual test												
5. Corrects test												
6. Selects own project (list)												
7. Gathers materials needed												
8. Works on own project												
9. Cleans up materials												
10. Leaves room												
11. Moves freely to centers												
12. Listens to tape												
13. Views filmstrip												
14. Writes learning contract												
15. Writes in log												
16. Waits for teachers help												
17. Culminates contract by sharing, etc.												
18. Rests head on desk												
19. Roams about room												
20. Disturbs others												
21. Miscellaneous												
B. Teacher-Pupil Work:												
1. Teacher reinforces pupils decisions												
2. Teacher accepts pupils ideas												
3. Pupil seeks teachers help												
4. Teacher assists pupil to evaluate												
5. Pupil responds to teachers questions												
6. Pupil discusses progress with teacher												
7. Teacher scolds pupil												
8. Teacher corrects pupil												
9. Teacher directs pupil												
10. Pupil responds openly to direction												
11. Miscellaneous												
C. Pupil-Pupil-Group Work:												
1. Pupil seeks help from another pupil												
2. Pupil receives help from another pupil												
3. Pupil contributes to group discussion												
4. Pupil takes group test												
5. Pupil answers question when asked												
6. Pupil asks question												
7. Pupil listens to lecture of demonstration												
8. Pupil watches group film												
9. Pupils play game												
10. Pupil brainstorms with group												
11. Pupil evaluates with group												
12. Pupil plans with group												
13. Miscellaneous												

DEVELOPING PROGRAMS*

SOME SUGGESTED PROGRAM GOALS FOR GIFTED STUDENTS

While these goals are worthy ones for any student they have special significance for the gifted.

I. Development of Leadership Qualities
   - A. Self-Discipline
     1. Better understand and recognize responsibilities
     2. Set reasonable goals in learning
     3. Organize and plan learning activities
     4. Make efficient use of time
   - B. Self Awareness
     1. Know yourself better and appreciate gifted qualities
     2. Develop self-confidence
   - C. Social Awareness
     1. Understand others who are not gifted
     2. Develop confidence in the abilities of others.
     3. Learn to tolerate differing points of view
   - D. Communication
     1. Become familiar with various means of communication
     2. Develop an awareness of the complexities involved in adequately communicating
     3. Develop critical thinking ability
     4. Become proficient in speaking, listening, reading and writing
   - E. Independence
     1. Better evaluate your strong and weak learning areas
     2. Better able to direct your learning

II. Thinking Skills/Creativity
   - A. Flexible thinking
     1. See different approaches
     2. Ability to shift categories
     3. Variety of kinds of ideas
   - B. Original Thinking
   - C. Elaborate Thinking
     1. To add on to
     2. Expand an idea
   - D. Problem Solving/Decision Making
   - E. Risk Taking
     1. Have the courage to expose oneself to failure or criticism
     2. Define your own ideas
   - F. Logic

*NOTE: THIS ENTIRE SECTION IS EXCERPTED FROM "SOME SUGGESTED GUIDELINES FOR PLANNING PROGRAMS FOR THE GIFTED/TALENTED" prepared by GRACE LACY, NEW YORK STATE EDUCATION DEPARTMENT.

III. Development of an Aesthetic Sense

IV. Enhance Independent Study Skills
- A. Enrichment of interest area
- B. Extension of classroom activities
- C. Proficiency of research skills
  1. Outlining: Skills in organizing materials
  2. Library skills: How and where to find information
  3. Research paper: Be able to find and organize material according to an accepted procedure.

V. Establish a Positive Attitude toward Learning

VI. Improvement of a Very Weak Academic Area
(This is an option and should not be considered a priority goal)

PROGRAM PROTOTYPES

Program prototypes are organizational patterns which become the setting for the learning environment that accommodates the needs of the gifted/talented. The use of any prototype is based on how it fits into the needs of the school and matches the objectives developed for the program and the needs of the students. No one prototype will do everything. Program form should be molded to the needs of the students and to best fit in with the total educational program.

The basis for developing any program prototype is found in using (1) some form of enrichment, (2) grouping, (3) acceleration and (4) guidance. The variations in prototypes are a result of how the various elements are put together and made available to students. Sandra Kaplan's diagram below suggests the possibilities. Fig. 6 Her Handbook For Providing Programs for The Gifted discusses the advantages and problems related to the various prototypes including:

* Cluster grouping within the regular classroom
* Special regular classes
* Part Time groups which meet before or after school or on Saturday
* Correspondence courses
* Ungraded or multiage classroom
* Continuous progress curriculum

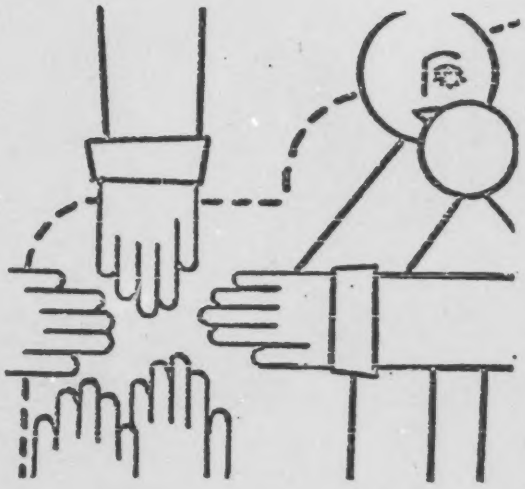
Program prototypes fall into two main categories:

Intra classroom Prototypes
* Independent study
* Tutoring
* Correspondence
* Cluster grouping
* Special regular classes
* Ungraded classrooms
* Supplemental activities

Extra Classroom Prototypes include
* Special interest groups before, during or after school

ELEMENTS AND KINDS OF PROTOTYPES

There are many classifications of prototypes applicable to a program for the gifted and talented. The basis for developing any program prototype is found in using some form of enrichment, grouping, acceleration, and guidance. Each alternative can become an element to be employed within the design of a prototype, or it can become a separate kind of program prototype. The degree to which each element is developed ultimately determines the kind of prototype. Thus, the variations between prototypes are a result of how these components are put together and how and when they are made available to students. A prototype may be identified by the predominant use of one element over another. It is less a matter of definition than it is a matter of recognizing the elements which direct the building of a prototype to accommodate the needs of gifted and talented students.



ENRICHMENT

ENRICHMENT is. . .
experiences which replace, supplement, or extend learnings as the basis for each type of prototype. Enrichment is the reason for the development or adoption of any prototype.

GROUPING	ACCELERATION	GUIDANCE
Provisions which facilitate the student's access to learning opportunities	Activities which promote learning beyond regularly prescribed curriculum	Experiences which promote understanding of the self and others and explore opportunities for careers
—Cluster grouping within the regular class —Special regular classes —Part-time groups before, during, after school or Saturdays —Seminars —Minicourses —Team teaching —Alternative schools —Resource room or demonstration classroom —Intinerant or resource teacher —Field trip and cultural events —Special summer	—Early entrance or preschool classes —Double grade promotion —Advanced placement classes —Ungraded classes —Multi-age classes —Tutoring —Correspondence courses —Extra classes for extra credit —Credit by examination —Independent study —Continuous progress curriculum —Year-round school —Flexible scheduling —Block or back to back classes	—Individual conferences —Group meetings —Career and vocational counseling —Educational counseling —Community programs and sponsorship —Scholarship societies —Study groups —Special education classes —Tutoring

* Seminars
* Community mentors and resources
* Advanced placement for part of the school day
* Counseling
* Tutoring
* Correspondence
* Teaming
* Resource centers
* Independent study
* Off campus enrollment

The Kaplan Handbook discusses the benefits and problems related to each of these prototypes and suggest exemplary practices in regard to them.

THE HEART OF THE PROGRAM: CURRICULUM AND TEACHING STRATEGIES

The curriculum, the content to be learned, gives substance to the program prototype. The curriculum defines the learning and guides instruction through a variety of learning experiences. It is a method for organizing teaching/learning activities to effect specific cognitive and affective growth.

The curriculum is not a prescribed route that every child must follow. It is a framework for learning alternatives. Current curriculum theory places emphasis on the flexible usage of curriculum as it relates to a student's needs. The concept of the fixed curriculum is giving way to the idea of a curriculum which suggests a variety of ways to achieve learning objectives. Child centered curriculum takes precedence over the subject curriculum. The starting point for curriculum building is the child's world and the end result of the learning experience is progress in self understanding as well as an increase in academic ability.

USE OF TEACHING/LEARNING MODELS

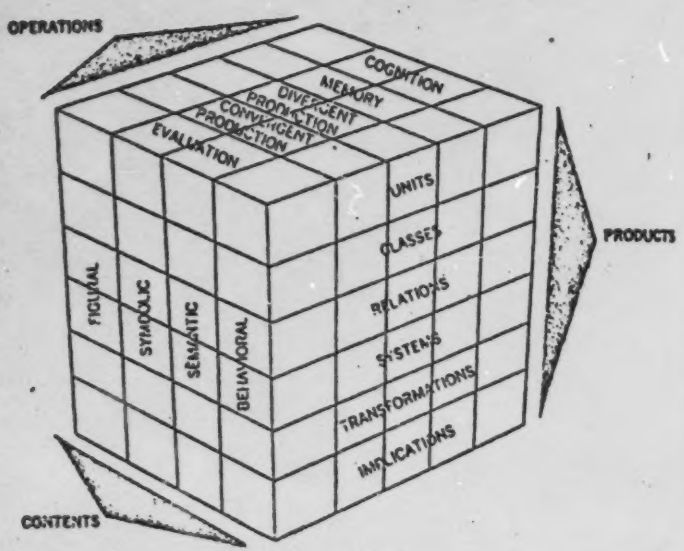
Although the primary emphasis for educating the gifted/talented is to allow them to become independent learners, this does not lessen the importance of the teacher's role. In teaching the gifted/talented the processes of learning and thinking are often more important than the content of a subject. In order to teach these thinking processes the teacher should be familiar with various teaching/learning models. As the teacher understands these models he is better able to interact comfortably and successfully with students. Knowledge of the models enables the teacher to depart from traditional teaching to meet the different needs of, and to stimulate the gifted in a differentiated manner.

A learning model presents a structure and scheme for developing or presenting a learning experience. No one model needs to be used to the exclusion of others. The idea is to adapt and modify and combine those elements from the various models which best enable the teacher to meet the needs of the gifted. Publications which describe and explain the models are listed in the bibliograpy. Useful models include:

* Guilford's Structure of the Intellect which presents the various components and classifications of intellectual factors. It indicates the ability as a combination of an operation or process, a content and a product. (Figure 7).

TEACHING /LEARNING MODEL

Guilford's
Structure of the Intellect



Purpose: This structure presents the various components and classification of the intellectual factors. It indicates that an ability is a combination of an operation or process, a content, and a product.

Implications	Applications
Analysis of teaching strategies	Individualizing instruction, classroom discussions, questioning, in-service training
Evaluation of student performance abilities	Developing strengths, correcting weakness, parent-teacher discussions, student placement, setting goals and objectives
Assigning of appropriate learning activities to the gifted	Emphasizing divergent and evaluative thinking operations
Applying to learning experiences	Differentiating the curriculum, developing curriculum

Products

Units--Items of information having "thing" character
Classes--Items of information grouped for their common properties
Relations--Connections between units of information
Systems--Organized or structured aggregates of items of information
Transformations--Changes of various kinds in existing or known information or in its use
Implications--Extrapolations of information, in the form of expectancies, predictions, known or suspected antecedents, concommitants, or consequences

Operations:

Cognition--Recognizing problems, needs
Acquiring knowledge
Memory--Recalling facts
Convergent Production--Finding an anticipated and/or correct answer
Divergent Production--Producing an original, unexpected response
Evaluation--Reaching decisions; making judgements

Contents:

Figure content--Information in concrete forms, as perceived or as recalled in the form of images
Symbolic content--Information in form of signs, such as letters, numbers, musical notations, and other "code" elements
Semantic content--Information in the form of meanings to which words commonly become attached
Behavioral content--Information, essentially nonverbal, involved in human interactions (22).

Variables Involved in Bloom's Taxonomy of the Cognitive Domain

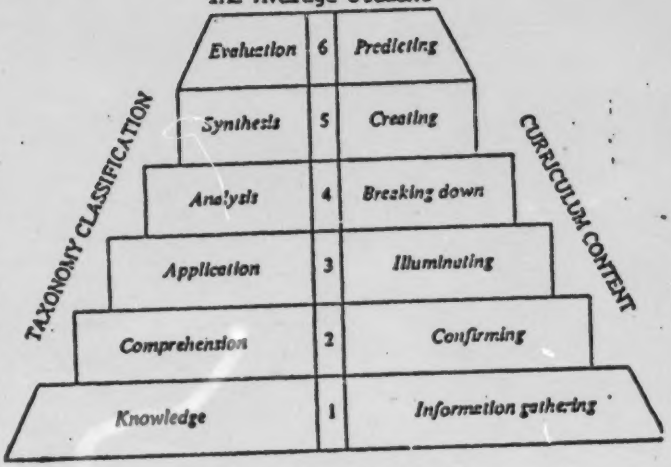
Purpose: Presents a hierachy of learning which recognizes that different skills are required of different levels of thinking. Indicates a means of advancing students along a continuum of cognitive behavior.

Classroom Emphasis: Implication and application: The emphasis for using the taxonomy is on adapting it to curriculum and the teaching process to focus particular attention on the categories related to abstract concepts and creative and critical thinking.

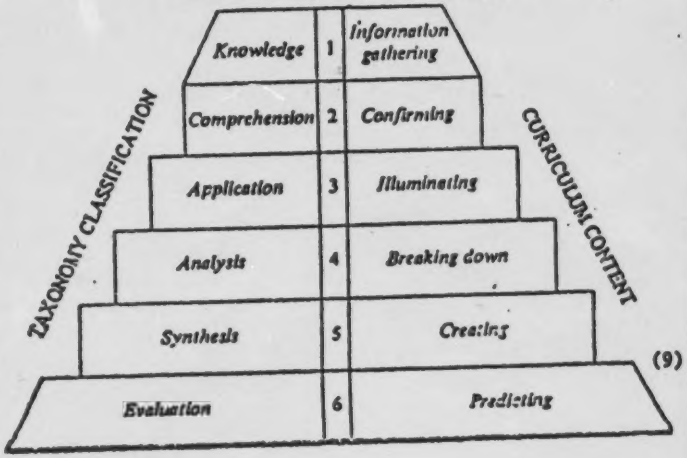
Types of Learning	What Students Do	What Teachers Do
Mastery of subject matter (knowledge) (memory)	Responds, absorbs, remembers, rehearses, covers, recognizes	Directs, tells, leads, shows, delineates, enlarges, examines
Comprehension (cognition)	Explains, extends, demonstrates, translates, interprets	Demonstrates, listens, reflects, questions, compares, contrasts, examines
Application (convergent and divergent production)	Solves novel problems, demonstrates use of knowledge, constructs	Shows, facilitates, observes, criticizes
Analysis	Discusses, details, uncovers, lists, dissects	Probes, guides, observes, acts as a resource
Synthesis	Discusses, generalizes, relates, compares, contrasts, abstracts	Reflects, evaluates, extends, analyzes
Evaluation	Engages in commitment, judges, disputes	Accepts, lays bare to criteria, harmonizes (15).

TEACHING/LEARNING MODELS

The Average Student



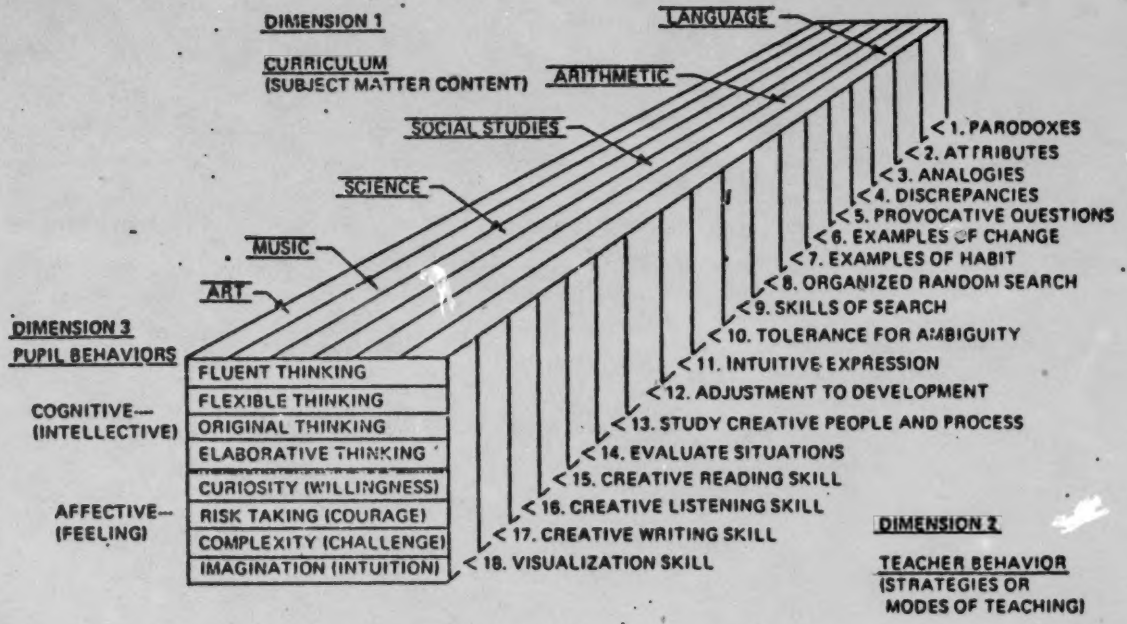
The Mentally Gifted Student



(9)

A Model for Implementing Cognitive-Affective Behaviors in the Classroom

D1=D2→D3



Purpose: Presents the dimensions of content-teaching processes and student behavior to emphasize the strands of possibilities within each dimension. Provides a vehicle for intersecting a given subject area with any teaching strategy. Extends the breadth of cognitive learning (53).

IMPLICATIONS	APPLICATION
Realizing the scope of thinking processes	Extending or developing curriculum

* Bloom's Taxonomy presents a hierarchy of learning which recognizes that different skills are required at different levels of learning. It is a means of moving students along a continuum of cognitive, affective or psychomotor behavior (See Figure 8).

* The Williams Model presents the dimensions of the content, teaching processes and student behavior to emphasize the strands of possibilities within each dimension. This is a model for implementing cognitive affective behaviors in the classroom (Figure 9). Publications explaining the use of these models are listed in the bibliography.

PRINCIPLES OF CURRICULUM FOR THE GIFTED/TALENTED

The curriculum should translate the basic principles of learning into practical activities for learning. The following principles should be components of curricula for the gifted.

1. Subject related
Learning activities should be related to something from which thinking and doing can be related. Example: Compare the human body parts to various machines. Here the thinking skill of comparison is stimulated.

2. Process Oriented
Thinking skills and not mere acquisition of facts should be emphasized. In likening the parts of the human body to machines the process of comparing is stressed as a skill of thinking.

3. Doing Centered Product Oriented
The learner should be actively involved in some task. The student could make a model of the various body parts as related to different machines (eg. knee joint and hinge).

4. Open Ended Application
Learning activities should allow for various personalized response. There is no stipulation as to how the comparing is to be done.

5. Student selected
Learning activities should provide options for individual differences in need, preferences and capability. The student can complete the task in any way he choses.

ELEMENTS OF CURRICULUM

Curriculum should contain the proper balance of content and process. The content is not an end in itself but becomes the vehicle for the student to acquire and develop specific skills. The understanding and absorption of the content becomes the prime objective for the learning experience.

Process refers to the methods of thinking which are emphasized. Thinking skills can be classified according to the teaching learning strategies of (1) problem solving, (2) creativity, (3) inquiry and (4) higher levels of cognitive operations.

DIFFERENTIATING THE CURRICULUM FOR THE GIFTED/TALENTED

Curricula for the gifted must be congruent with the characteristics which define them as a distinct population. Differentiation of curriculum for the gifted and talented relies on the elaboration of certain variables, procedures for presenting learning opportunities, nature of the input and expectancies for learning outcomes, the entrance level, the amount of time involved, and the level and depth of experience involved. The basic key to curriculums for the gifted is that they should not be "more of the same." The task is not to add more reading, more arithmetic, more science but to help the gifted child find greater meaning in the life around him. This differentiation can be provided within the regular curriculum or in separate curricula and may involve:

* Accelerated or advanced content
* Higher degree of complexity of content
* Introduction of content beyond the prescribed curriculum
* Student selected content according to interest
* Working with abstract concepts in a content area
* Level of resources
* Types of resources available
* Appropriation of a longer time for learning
* Creating or generating something new]
* Recognition that the student can learn abstract concepts more quickly
* Transfer of learning to areas of greater challenge
* Formulation of new generalizations
* Development of higher level cognitive processes
* Independent research

PROCESS EDUCATION

Many educational innovations focus on providing more effective instruction through emphasizing the process of thinking, feeling and learning, not just on the content of learning. These innovations are described under a variety of different names such as process education, humanistic education, open education, and informal education. Process educators are committed to helping students learn more effectively how to use their imagination, judgment, problem solving, discrimination and decision making abilities. They are less concerned with content (facts and information) that have been traditionally the classroom teacher's primary concern. While certainly all children must master the basics for these are what one needs to get an education, teachers should not allow the "back to basics" cry to deter them from developing these higher abilities, which are also basic to survival in a complex technological society . The process educator realizes that it is impossible to teach all the facts students need to know or even to agree on which ones are the most important. They know they must teach the student to learn how to learn, to problem solve and to be able to find new and creative ways to cope with a world characterized by unceasing and escalating change. While such education is important for every child it is especially so for the gifted.

HUMANISTIC EDUCATION

Humanistic educators are concerned with developing whole human beings able to

function effectively in a participatory democracy. They are concerned not only with the cognitive but with affective education as well. Their orientation is well expressed in the humanistic psychology of Carl Rogers.

Although it is important to develop humanistic education in general, it is of paramount importance that we make sure that the gifted/talented from which will come our future leaders of tomorrow are whole individuals, individuals that possess an enormous amount of knowledge and at the same time are sensitive caring people, humanitarians that place great stress on concern for ones neighbors. The definition of gifted and talented can no longer be viable and accurate if their intelligence quotient is the major factor for entering the programs. This type of mind set leads to tunnel vision and narrows the capabilities of programs. To foster humanistic education teachers must be:

*Process oriented rather than subject oriented
*thinking oriented rather than memory oriented
*valuing oriented rather than one social set oriented
*challenge oriented rather than passive or acceptance oriented
*caring, sympathetic, compassionate oriented rather than cold and calculating oriented
*people oriented rather than material abundance oriented

The humanistic approach to learning is a wholistic one, an interdisciplinary approach that helps the students to see how various bodies of knowledge interrelate and what this knowledge means to man. This approach not only increases meaning but also makes it more relevant to students, since they can better see how it relates to their own lives. Such an approach involves not only the facts of history and other subject matter but interrelates the arts: music, poetry, literature, the visual arts which are highly affective in content. Through involvement in these arts students not only learn the meaning of other symbols but learn to communicate more effectively and become sensitized to their environment and to others. Deep concerns are aroused and the student grows into a more well-rounded human being.

Interdisciplinary courses are best taught by teams of teachers with specialties in the various areas, but there is now a vast variety of learning aids in the area of arts and humanities which can help teachers incorporate a humanistic approach into learning. However, no teacher can do a creditable job with humanistic education without some training in the various arts, art appreciation and history, and a wide cultural background.

TELESCOPING THE BASIC CURRICULUM TO PROVIDE EXTRA TIME

The gifted child should not be penalized by being expected to do the all of the regular curriculum work and then all the enrichment or accelerated program work as well. Because he learns much faster than others the regular curriculum should be telescoped so that he does not waste time in unnecessary practice on skills and concepts he has already mastered. He should not have to make up work he misses out on when he attends enrichment or other gifted classes. School curriculums are very repetitious. If he misses a concept such as "main idea" or "supporting details" in reading the topic will come up repeatedly in the future.

COMMITMENT TO LEARNING: NOT MERE COVERAGE

Since many teachers are coverage minded the bright child is often pressed to learn more and more facts and concepts. So long as the child is interested in doingthis such work may be enriching. However the compulsive coverage of subject matter may become simply verbalism and may ignore the natural limits of learning and discourage the child. Since the bright child will probably go on to college or other higher education the elementary and secondary schools should share more responsibility in stimulating interest in learning, in building motivation and good study and thinking habits than they do in coverage of subject matter. Thus student participation in planning, committee activity and other devices which give promise of developing greater degrees of involvement or commitment to learning may stimulate abiding interests which will be more beneficial to the student than the present coverage at a low level of student involvement.

DEVELOPMENT OF CREATIVITY

There is today an increasing emphasis on developing creative behavior because of the great need to find creative ways to solve the enormous problems facing the country and civilization itself. Simply defined creativity is the effective utilization of knowledge--it is the putting together of known bits of knowledge in new and unique ways. Since creativity depends on knowledge, wide experiencing can enhance the possibility for creative thought and behavior. E. Paul Torrance, of the University of Georgia, and Sid Parnes of the Creative Education Foundation at Buffalo, believe that creativity is not hereditary but can be developed in the individual. Big business has long used the methods Parnes advocates for problem solving and the development of new products.

Although teachers show increasing awareness of the need for encouraging creative thinking in children our present educational system to a large extent still overlooks the intentional enhancement of such behavior. Research shows that teachers spend most of their time telling children what to do or giving them information rather than eliciting creative imagination or thinking. A major goal of education for the gifted should be the development of independence, originality, and a desire for creative expression and the ability for creative thinking and problem solving. Although it is foolhardy to believe that exercises to develop creativity can promote the growth of a creative genius, the provision of an atmosphere which welcomes creative thought and expression can uncover and encourage creative potential.

Research suggests that there are certain things the teacher can do to create such an atmosphere, and these include:

- Helping the individual to understand the indluence of his background on his behavior so that he can get rid of unnecessary blocks to creative thought and performance.
- Helping the individual percieve himself as a creative being.
- Providing an atmosphere where creativity is encouraged, thus freeing the individual to take risks in expressing or working on creative ideas.

There are now commercial materials which purport to develop creativity in children as well as tests which purport to disco ver creativity. As yet their is little research proving or disproving the validity of these items. The Educational Improvement Center at Pitman, New Jersey has developed a K-12 series of exercizes for the development of creativity in youth and is now in the process of having this project validated.

While no school can afford to overlook these new developments and all should certainly encourage creativity in youth it is wise to proceed with caution for untrained teachers who hop on to a bandwagon without fully understanding the theory and concepts behind this movement could discredit a most worthy development. As pointed out above, the need for teacher training is paramount in providing quality programs for the gifted.

TIME FOR INDEPENDENT LEARNING: QUALITY NOT QUANTITY

Caution: Because the bright child can and does perform most of the tasks assigned to him there is a temptation to load him down with teacher or parent directed activity. He takes more and more subjects and participates in more and more lessons and courses. While a good case can be made for many of these activities, if overdone no "breathing room" is left for the child who is forever meeting the expectations of others. If this is the case he can never become a self directing learner.

To meet this need for independent learning the schools should provide programs of independent study from K through 12. If the student is a self starter, well and good. If not, the teacher must help him get started, be there for consultation where necessary and must set requirements so that the youngster does not simply coast.

Piling on academic solids reduces the bright child's opportunities to explore in expressive fields at his own rate. Art, music, industrial arts, home economics are often sacrificed to make way for additional elective work in academic fields characterized by study and recitation rather than by creative expression. Without such opportunities one whole side of the child's self lies undeveloped. Time for independent study and artistic activity, not additional assignments and a heavier load, is the key to development of self direction and creative interests.

Program activities need to be continually evaluated. Are they routine or stimulating? The emphasis must be on quality, not merely on quantity. High standards must be employed for hig h ability students.

While intellectual ability is to be challenged and valued, an intellectual snobbery that patronizes or ignores social, artistic and physical values is not rewarding. However in a culture which rewards athletic prowess with praise and fortunes the school has a special responsibility to hold intellectual values hig Incentive for intellectual achievement and rewards for this achievement must be provided.

HIGHER LEVEL THINKING SKILLS

A basic purpose in all grades and courses is the development of critical thinking. Reflective, analytical, creative and critical modes of thought are characteristic of the intellectually gifted. While thinking cannot be taught in a vacuum, the ability to use thought processes is a more important outcome than any of the curriculum. Modes of thought are residual after the content of schooling is forgotten. We cannot know all the content the child will need to know in the unforeseeable future or even that which will be most useful but we do know that all students will need to think effectively. Emphasis should be placed on the development of clear thinking rather than on content for its own sake.

The Great Neck Schools have developed a State Validated Critical Thinking Program. The contact person is Hannal Masterson. The Education Department has manuals and guidelines for Critical Thinking Programs.

MORAL DEVELOPMENT AND SOCIAL CONSCIOUSNESS

Moral development and social consciousness are extremely important for the gifted since it is likely that they will gain leadership roles. Intellect can be used for good or evil. A fundamental goal in education of the gifted must be the building of an awareness of social responsibility in using their unusual gifts and talents. The Education Department has also developed materials related to Values Education.

BALANCE AND BREADTH

Balance and breadth are essential ingredients in a curriculum for the gifted. Opportunities must be provided to explore in a variety of fields;in artistic and manipulative fields as well as academic areas. The bright child like others has great need for expression and emotional release and needs opportunities for such expression as well as for intellectual growth. Exposure to many kinds of experiences assures a balance in the child's educational diet. Balance should characterize several dimensions: intellectual and emotional, mental and physical, individual and social, critical and creative, work and play. Not every bright child will excel in every endeavor. The task is to make opportunities for wide experience possible, to open doors, to illuminate a wide variety of possibilities. Flexibility rather than uniformity should characterize the curriculum. A variety of offerings rather than a narrow curriculum facilitates the flexibility needed to meet individual needs and interests. The goal should be a rich environment from which guided choices can be made. No existing prescribed curriculum can guarantee success. Instead of tailoring the student to fit a preordained curriculum perhaps we should tailor the curriculum to fit the student. Commitment to narrowly prescribed courses does not provide such flexibility. Teachers and administrators should have freedom to depart from accepted norms in building curricula for the gifted/talented.

PREPARING FOR THE PROGRAM

Students, staff and parents must be introduced to the program to promote awareness and understanding of program goals. Formal or informal meetings should be held to acquaint people with the purposes and mechanics of the program. Key staff persons and especially the administrator should thoroughly comprehend the program so that they can answer questions about it and be supportive of it. Efforts to communicate about and publicize the program increases the potential for it to become an integral part of the institution. The availability of some sort of "handout" and visual presentation which can be transported and shared at various meetings is helpful. Students should also be used as spokesmen for their program. Brochures, bulletins, news releases and speakers will assist the community to understand and support the program.

GOOD TEACHERS ARE THE KEY TO GOOD PROGRAMS

The key to good programs is the selections of teachers and administrators adequately trained in the methodology and well versed in the philosophical ideals relevant to the characteristics and needs of the gifted/talented. They are a prerequisite to good programs. Teachers who can act as facilitators should be given high priority for gifted programs. The teacher should be an initiator rather than a dispenser of learning.

CRITERIA FOR TEACHER SELECTIONS

Teacher of the gifted/talented should:

- Be able to facilitate productivity in the child.
- Possess a sense of humor.
- Enjoy the reputation of a highly superior teacher.
- Possess emotional maturity and have a positive self concept.
- Be flexible and tolerant of diversity.
- Display positive attitude toward gifted and talented children.
- Demonstrate innovative approaches to teaching.
- Show evidence of superior intellectual ability.
- Be able to develop teaching strategies which engage children in the higher orders of intellectual ability.
- Have superior knowledge and performance in at least one area.
- Have some training in the area of education for the gifted and opportunities for continued professional growth.

The teacher is the key figure in any education but especially so in programs for the gifted because so much more is demanded of him/her. Teachers must fill the role of mentor and a model of intellect, interest and achievement, must stimulate not only intellectual interests but social concerns as well. The choice of teachers cannot be left to chance or rotation. The choice cannot be made of the "best teachers" but the teachers "best for the gifted". For the gifted the best will not necessarily mean those with the highest degrees, it will mean those with the ability to stimulate the gifted to maximum learning. Moreover, it means those who are specifically trained to teach the gifted.

IMPROVING PROFESSIONALISM AMONG EDUCATORS OF THE GIFTED/TALENTED

The increased amount of research done during recent years should affect program development. Unfortunately because of a general lack of interest in the gifted in the past decade, many colleges and universities have not offered courses in education of the gifted. Consequently large numbers of teachers are not well versed regarding this area of special education and thus need further training to develop and implement good programs. For this reason the Education Department is establishing a Teacher's Center and Clearinghouse for Educators of the Gifted and Talented at the World Trade Center so that educators in the metropolitan area can quickly acquire needed understandings and skills. The Center will provide lectures and seminars by experts in Special Education at the Center and also provide on-site services to school districts. In addition it will recognize the British Teachers Center Concept, which is based on the idea that teachers--the practictioners who are working daily with children, have a great deal of expertise which they can share with others and also that teachers should have more to say about their own professional development. The Center will provide a forum for teachers to share ideas through demonstrations and exchange of materials and mutual problem solving. It will also provide a clearinghouse for information about programs in other schools, cities and states, commercial materials and copies of lesson plans and guides so that schools can profit from what others have done and thus spend less time in "reinventing the wheel".

THE ROLE OF THE ADMINISTRATOR IN PROVIDING PROGRAMS FOR THE GIFTED/TALENTED

Certainly the administrator must be aware of these new developments in the field of special education. He must be an active participant in helping to plan programs for the gifted and must make administrative provisions so that programs can function, and above all must provide a climate conducive to the health and growth of the program. To do this he must fester and understanding on the part of regular staff and the community of the goals and operation of the program. He must also provide time for teachers to plan the program and the curriculum as well as for professional growth through attendance at conferences, workshops and site visitations. Teachers need this time for planning and for personal growth and for exchanging ideas with other teachers. While the administrator plays an important role in making the organizational and administrative adjustments, his greatest contribution comes in the leadership he gives his professional staff in cooperative planning and in his provisions for opportunities for the teachers to increase their professionalism.

MOTIVATION AND GUIDANCE ARE NECESSARY

The most important job of instructional guidance personnel is to help teachers plan and to help develop and maintain high levels of aspiration in gifted pupils, for underachievement in this group is often the result of lack of motivation.

In some communities the culture may provide the necessary motivation for learning, but in many others (particularly those of the center city), the culture may be the chief bar to achievment of promise. Early recognition of low motivation and correction of resulting underachievement is vital so as to reach pupils before serious attitudinal damage is done.

Provision for development of worthy self concept must be built into programs particularly for those who are the underachieving or handicapped gifted. Not all gifted pupils are gifted in every area. Some may have serious deficiencies in the basic skills. Provision must be made for remedying these deficiencies, but gifted/talented children should not be penalized and kept out of all activities for the gifted because they are lacking in some area of basic skills. Often the motivation of a program more suited to their needs and interests will spur them to greater achievement in the skills area.

EVALUATION OF PROGRAMS FOR THE GIFTED: SOME SUGGESTIONS AND CAUTIONS

It must be understood from the outset that objective evaluation of programs for the gifted and talented is an extremely difficult task for the following reasons:

- The long range goals of such programs--such as the objective of having the student become an independent lifelong learner are difficult to measure in a short time span.
- Since gifted pupils are already operating at a high level it may be difficult to see large gains on tests.
- There are few if any valid instruments for accurately measuring many of the qualities that programs for the gifted hope to nurture in the gifted.

However, there are three basic approaches to evaluation designs which may be used: (1)<u>product measurement</u> (2)<u>process measurement</u> and (3)<u>presage</u> . Each has its own strengths and weaknesses; but when applied to assessment programs for the gifted and talented there are special cautions and limitations which should be noted:

1. <u>Product evaluation</u>: This type of assessment attempts to find "hard data" but it is difficult to be certain if the measured growth was really caused

by the special program unless a control group has also been measured. Moreover the growth could be caused by extraneous factors. For example the growth shown may simply be the result of the fact that the children are gifted. Giving a pre and post test to a single group can therefore yield results that are nearly impossible to interpret correctly.

Another problem relates to the instruments available. Tests which measure general achievment can hardly be expected to measure the many specific and unique learning experiences that characterize programs for the gifted/talented. Nor do they do a very accurate job of assessing higher level cognitive abilities, creativity, problem solving, judgmental abilities or upper-range affective and non-cognitive concerns such as interests and values. Moreover most norms on tests are based on average populations and thus may be inappropriate for gifted shildren.

It should also be remembered that many gifted students entering programs are already operating on high levels and they may be close to the test ceiling at the beginning of the year. Moreover regression effects tend to occur. Students scoring very high tend to regress toward the mean. This purely stastical phenomenon makes it rather difficult to demonstrate large gains in programs for the gifted.

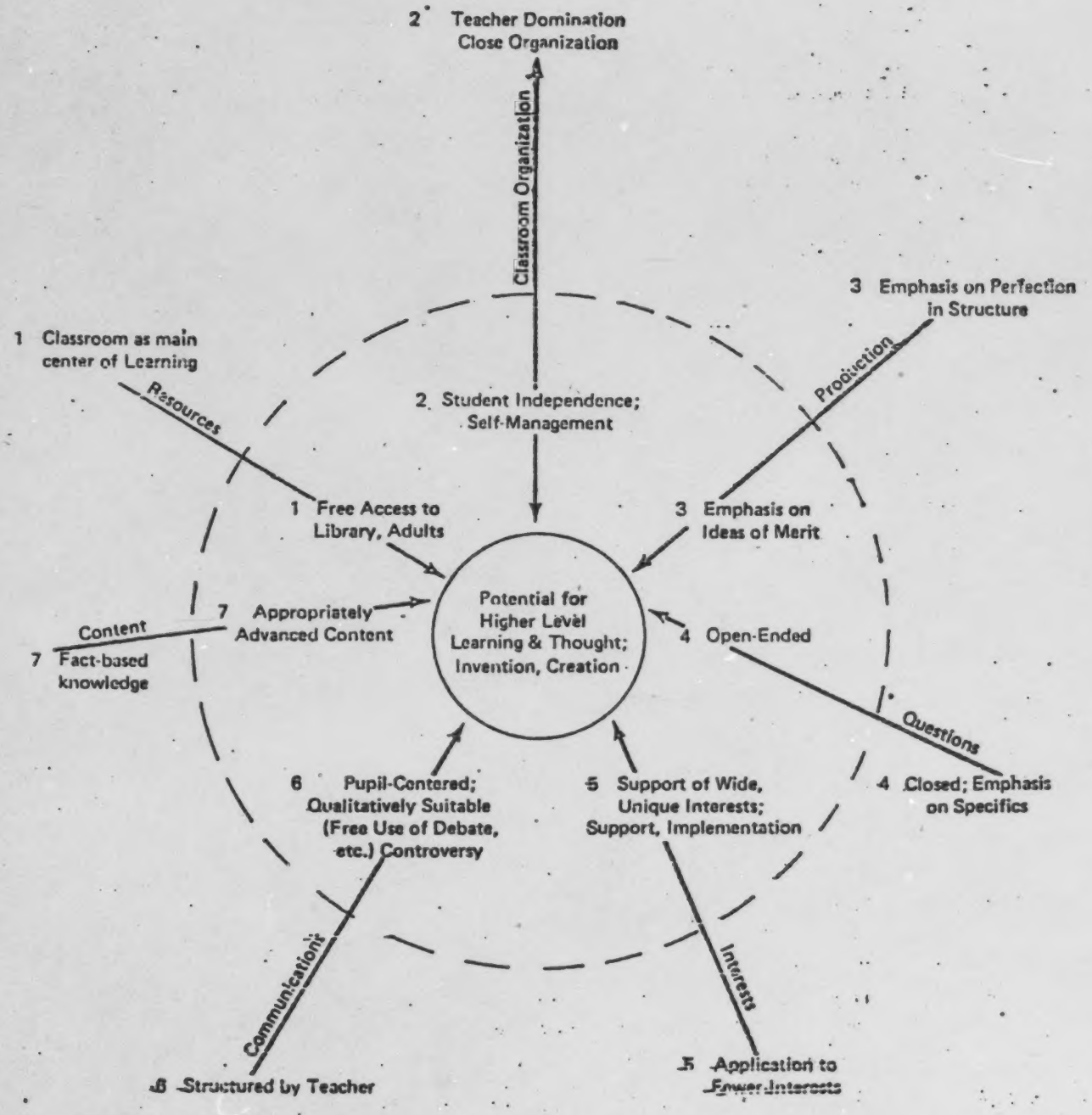
2. Process Evaluation: In programs for the gifted it is appropriate to measure ongoing student-teacher behavior and the level of thought processes and instructional questions. The major pitfall in this approach lies in the low reliability of observations. Moreover the lesson observed may be a showcase lesson and not really typical of what happens every day. A possible way around these problems may be to use students themselves as observers in the Class Activities Questionaire. Other instruments used for measuring process include the Flander's Interaction Matrix and the Cerli Matrix.

3. The Presage Design attempts to estimate the quality of a program by assessing key variables much as personnel managers attempt to evaluate job applicants on the basis of factors that are assumed to have a positive relationship with success on the job. The DESDEG (Diagnostic and Evalutive Scales for Differential Education for the Gifted) model is one method of determining the quality of characteristics essential for the success of the programs for the gifted.

Perhaps the best compendium of information on evaluation of programs for the gifted is the Guidebook for Evaluating Programs for the Gifted and Talented, by Dr. Joseph Renzulli, available from the Ventura County School, Ventura California.

FOCUS ON THE GIFTED
TEACHER ACTIVITIES AND BEHAVIORS*

Meaningful (inner circle), and Less Meaningful (outer circle)



FOCUS ON THE GIFTED
IN VERBAL FORM

MEANINGFUL LEARNING FOR THE GIFTED

1. Children have ready access to library and other resource materials.

2. Students are involved in independent study activities. The teacher does not dominate the classroom and does not run the class as a "tight ship" but permits the student to have freedom in selecting and pursuing problems and in creating.

3. Major emphasis is given ideas of merit and the enhancement of these ideas.

4. The teacher's questions are open-ended, with an emphasis on generalization, analysis, and synthesis.

5. The interests and abilities of the students are utilized in planning and implementation of curriculum materials.

6. Discussion, utilizing debate and controversial issues, is freely used in the classroom.

7. Appropriately advanced content is available to the students so that there can be exploration in depth.

LESS MEANINGFUL LEARNING FOR THE GIFTED

1. Teacher and materials in the classroom are the main sources of information. Children do not have the freedom to utilize library resource people.

2. Class is run as a "tight ship". The topics and activities are prescribed for the students and there is very little deviation from the routine.

3. The major emphasis in product on is in correct usage, neat papers, proper spacing and punctuation, etc., rather than on concepts and ideas of merit.

4. The teacher's questions are primarily closed-type questions with an emphasis on specific facts and rote memory.

5. The course of study is followed very closely, with little attention being paid to the interests of the children.

6. The lessons are carefully structured and there is little room for debate and controversy.

7. The content is based on specific facts and there are very few opportunities for exploration in depth or going beyond the grade level material.

DIFFERENTIATING THE CURRICULUM IN TERMS OF CONTENT, PROCESS, and PRODUCT

For gifted/talented students, the regular school curriculum should be expanded, extended, enriched, studied in greater depth, and/or accelerated.

The following pages contain suggested ideas for differentiating the curriculum in terms of content, process, and product using the resources of the school, the home, the community, and the city.

Many of the suggestions are presented in terms of The Enrichment Triad Model:

Type 1 General Exploratory Activities

Type 2 Thinking or Process Activities

Type 3 Individual or Small Group Investigations into Real Problems

*Topics include:

Making Paper/Recycling Paper

Weather Report/Setting up a Weather Station

The Museum You Live In/Architecture

Tracing Your Own Roots

Looking at the Future

Metric Measuring

Newspaper Math

Creativity and Old-Time Radio

Paper Bag Skeletons

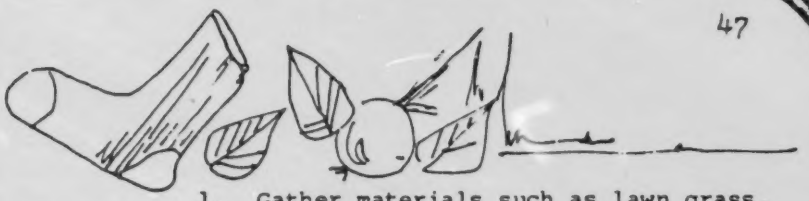
Holiday Activities

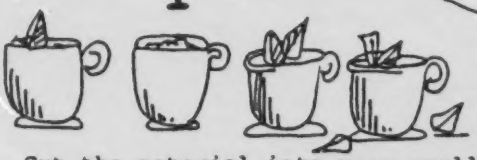
*CONTENT

TOPIC: MAKING PAPER/RECYCLING PAPER

Articles are reprinted from Eco-News and Gifted/Talented Education with thanks.

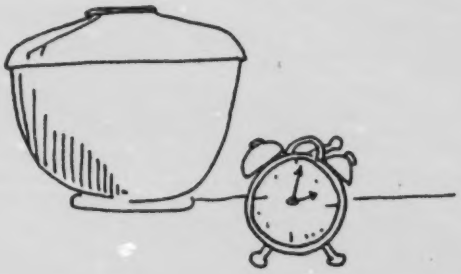
MAKING Paper



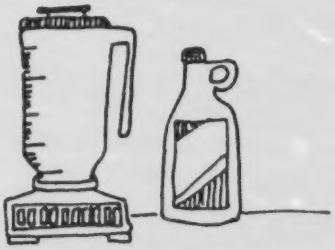


1. Gather materials such as lawn grass, onion skins, celery, old socks, egg cartons, pumpkin, leaves, etc.

2. Cut the material into very small pieces. You'll need at least 4-6 cups. Place the cut materials into a glass bowl and cover it with boiling water.



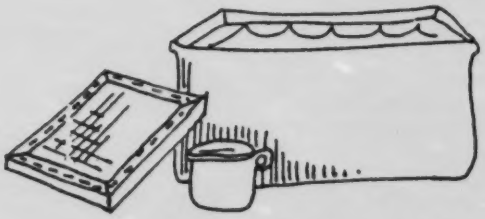
3. Slowly add 5-6 teaspoons of Drano or something with caustic soda in it. Cover the bowl and set it aside for 24 hours.

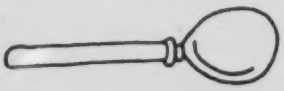


4. Drain off the "Drano-water" and rinse the material which is now starting to "break-down." Put the materials in a blender and blend it with one part bleach and three parts water. Blend until smooth and free from lumps. You have now made pulp.

5. To make slurry, take one cup of pulp and add it to one gallon of water. Place the slurry in a large basin.

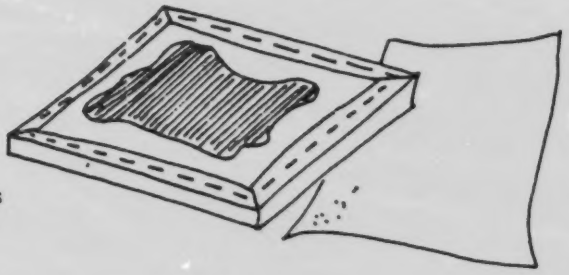
6. Make a screen using a wood frame covered tightly with a porous material.



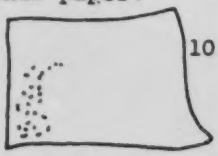


7. Stir the slurry to separate the fiber particles. Dip the screen into the slurry.

8. Lift the screen catching a film of fibers onto the screen's surface. With practice you'll learn to make a smooth film.



9. Drain the film and then blot it onto white felt. You now have made "new paper." Butterflies, pressed flowers and leaves can be placed between two sheets of wet "new paper."



10. Remove the "new paper" from the screen and let it dry. To finish the "raw" paper coat it with a mixture of one part white glue and four parts water.

STUDENTS WILL ENJOY CREATIVE WRITING EXPERIENCES ON PAPER THAT <u>THEY</u> HAVE MADE!

-6-

from GIFTED/TALENTED EDUCATION May 1977

MAKING PAPER

by Beverly Hoskins, Teacher
Alcott Elementary School
and Charles Fischer, Director
Murdock Teaching Center
Wichita, Kansas

One skill learned by a teacher of the gifted from Alcott Elementary School in Wichita who attended a teachers' workshop entitled"Back to the Basics of Books" was how to make paper. This teacher, Bev Hoskins, returned and shared the idea with her colleagues and her students. Using a "webbing" concept of management Mrs. Hoskins and two other teachers---Mr. Janzen and Mrs. Bodecker---implemented an interdisciplinary project, with the encouragement and support of the school principal---Mr. James Gilbert. This project involved students from grades four, five, and six.

The interdisciplinary approach is one that is feasible, practical, & educationally sound. It can be introduced in traditional settings and can be instigated by a single individual or by a small number of teachers that agree to pool resources and interest and "team-up"for better and more successful teaching experiences. The interdisciplinary approach can be introduced within present budgetary and administrative frameworks and requires only imagination, enthusiasm, and commitment on the part of teachers and administrators.

In this project, Mr. Janzen served as a resource teacher for math and social studies, Mrs. Bodecker as resource teacher in typing, and Bev Hoskins as a resource person for language arts and science. During the process of learning to make paper the students became interested in the variety of material which could be used for the making of paper. (Instructions are printed from *Your Teacher Center Idea Notebook*, with the permission of its editor---Charles Fischer, on page 6 of this newsletter) The students used onions, carrots, potato peels, iris leaves, pumpkin, bamboo, bark of trees, grass and finally lint from the dryer. The most unigue paper was made from raw pumkin processed with one-half of a paper egg carton and one liter of dryer lint.

Using the finished pumpkin paper as part of an art project, the students mounted the paper onto heavy construction paper and added quilling which they had made during a study in social science (see photo on page 5). As a culminating activity, each student wrote and typed a poem which was added onto his/her newly-created paper.

The students made frames as a project in the determining of lengths of materials to be utilized and the angles to be cut (math learning).The frames were stained with a wax boot polish, then used to frame the decoupaged art project which had started with the students' interest in making paper. The products of this paper making project were things of beauty with deep personal meaning for the parents who received them. An example of one of the poems is reproduced in the adjoining column.....

A POETIC REPORT

To teach---to learn
But often where to start?
And then which part
In order to discern.

But first the need
The decision to begin
But what part and how often
Ah so---papers from reed

From science---paper
And math---a frame
From wood became
A delightful caper

In English an Ode
Spelling to make right
A new meaning in sight
Typing like a code

One last artistic touch
The quilling, a special style
That ties it all together
for this while
And one that means much.

SAN FRANCISCO TO HOST TWO CONFERENCES ON GIFTED

During your summer vacation you may want to attend the National Conference on Alternative Modes of Assessment: Procedures for Identifying Gifted Children, July 18-22, and/or the World Conference on Gifted Education, July 27-Aug. 2.

William Cummings, Past-President of the California Association for the Gifted, coordinates the workshop on alternative modes of assessment. He assures us that they have a procedure for identifying potentially gifted children without resorting to the usual I.Q. testing.

University credit is available--- phone 415 469-1414 or write Summer Sessions, 1600 Holloway Avenue, San Francisco, CA 94132, for information and housing arrangements.

from GIFTED/TALENTED EDUCATION May 1977

ECO-NEWS

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A Young People's Environmental Newsletter

235 East 49th Street, New York, N.Y. 10017 · 486-9550

VOLUME II, NO. 9 REPRINT MAY 1972

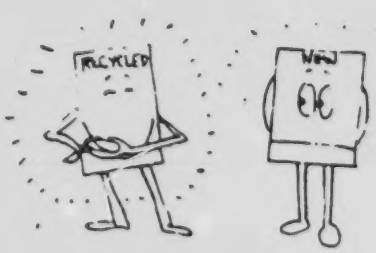
THE BIRTH AND LIFE OF A PIECE OF PAPER

How many kinds of paper can you think of? Newspaper. Writing paper. Candy wrappers. Subway posters. Paper bags. Have you ever wondered how paper is made? Most paper is made from trees. People cut the trees down. They cut the trees into logs and bring them to a paper mill. At the mill the bark is taken off the logs. Then the wood is chopped into tiny pieces called chips. These chips are mashed with water to make a mushy soup called pulp. Usually the pulp is mixed with many chemicals and cooked before it is put into a paper making machine.

Have you ever wondered what happens to used paper? Most paper goes into the garbage when you have used it. It is buried in landfills and dumps. Or, it gets burned in incinerators. No one uses it again. Many people feel it is wrong not to use paper again and again. They think the paper should be made into pulp again and then made into new paper. The new paper is called recycled paper. This recycling would make the life of paper longer.

These days, some paper is being recycled. New paper is made from other paper, not trees. Old paper is collected and brought to a paper mill. Here it is chopped up and mixed with water to make pulp. This is just like the pulp made out of wood chips. Sometimes the ink is washed out of the old paper. Then the pulp is put into the paper making machine.

Recycled paper is good paper. It is hard to tell that it is made from used paper. Some newspapers are made from recycled paper. Some paper napkins are made from recycled paper. Eco-News is made from recycled paper. You can even buy recycled birthday cards!



LEARN MORE ABOUT RECYCLED PAPER.

MAKE YOUR OWN RECYCLED PAPER.....

9/72

FACTS ABOUT RECYCLED PAPER

What is recycled paper made of?

Recycled paper is made from other paper, not trees. Many kinds of paper can be used to make new paper. A company in Wisconsin has even discovered a way to make recycled paper from old milk cartons and ice cream packages. The wax coating is taken off in a special process. The paper that is left is mashed up and made into new paper for offices and schools. Next time you look at your milk carton in school, think of the recycled paper that can be made from it.

Most of the wax covered things that this company uses are factory mistakes. Packages might have words spelled wrong or look lopsided. But sometimes they also buy things that have been used by people. They buy some milk cartons from schools.

The first time they bought milk cartons from schools a funny thing happened. All the kids put their milk cartons in special waste baskets at school. Then all the containers were put in a special machine to crush them. When the men turned the machine on, they got a funny feeling at their feet. Their feet were getting wet. Pretty soon they were standing in milk up to their ankles. No one had told the kids to empty out the cartons before they threw them away. PEOPLE HAVE TO BE TOLD HOW TO RECYCLE!

Different papers don't get along together.

There are many different kinds of paper. Each paper recycling company has to choose what kind of scrap paper it needs to make recycled paper. They need one kind of scrap paper to make school paper, another kind to make tissues, and still another kind to make newspapers.

Some paper mills are very fussy. For example, they might not want shiny magazine paper with a lot of colors. It means more work for them to get the color out. Some mills can mix up a few different kinds of paper. But first they must know what is there. It is like cooking. Each paper mill makes new paper with a special recipe. It needs certain kinds of paper for the recipe.

How strong is it?

Paper contains many little fibers, or little threads. Every time the paper is mashed up into pulp, these fibers are cut shorter and shorter. So recycled paper is not as strong as paper made from trees. But it is still strong enough for most uses.

from ECO-NEWS May 1972

WHY SHOULD WE RECYCLE PAPER?

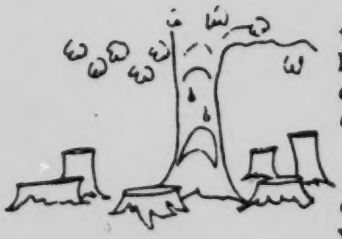
People want more paper now.
There are more people now.

People use more paper today than they did years ago. We throw more things out. We buy fancier and bigger packages made out of paper. We use paper napkins, towels, plates and cups. Our grandparents didn't use them. There are also more people today and all of them use more paper every year. That means more and more trees have to be cut down to make all this paper.

Recycling saves trees.

It takes many trees to make a ton of paper from wood. Recycled paper is made from other paper, not wood. If people buy paper made from paper instead of wood, they will be saving trees.

We are running out of trees.



Paper companies plant new trees when they cut down trees. They study how to make trees live longer and grow bigger. But it takes a long time for a tree to grow big enough to be used for paper. Some trees die before they can be used. And people keep asking for more paper.

So paper companies need more trees. They are cutting down trees in our national forests today. Ten years from now we will probably need more trees than we can grow. What will we do then? SAVE A TREE. USE LESS PAPER. USE RECYCLED PAPER.

Recycling helps save our environment.

If we recycle our paper we won't have to burn it in incinerators or dump it in landfills. We will have more land for parks and playgrounds. Remember, people are worried about where to put all our garbage. Saving paper and recycling it keeps it out of the garbage.

Recycling saves money.
Recycling makes money.

Garbage costs money. Incinerators, landfills, garbage trucks and salaries of sanitation men cost money. But if paper is recycled, it won't go in the garbage. We'll need less incinerators, landfills and dumps. Sanitation men will have time to clean our streets better. Cities will have extra money to plant more trees and have more parks and playgrounds.

Reprinted from ECO-NEWS May 1972

NEWSPAPER RECYCLING IN YOUR NEIGHBORHOOD

The Environmental Protection Administration (E.P.A.) is the government agency that fights pollution in New York City. E.P.A. thinks that recycling can help solve some of New York City's garbage problems. If garbage is recycled into new products, we won't have to burn or bury it. So E.P.A. has decided to try an experiment. They want to find out if New Yorkers will help them recycle newspapers.

Here is how the experiment will work. E.P.A. picked out a few neighborhoods in Queens, Manhattan, Brooklyn, and Staten Island. They are asking people in each neighborhood to separate newspapers from their garbage and to put them outside on the curb on certain days. Special trucks will pick up the newspapers on these days so that they can be recycled.

THE CITY NEEDS YOUR HELP

If this experiment works, someday New York City might be recycling all its newspapers. But this can only happen if you and your friends and neighbors help. Here is what you can do:

1. Find out what days the newspapers will be picked up in your neighborhood. Your teacher has information about this.

2. Tie your newspapers firmly into bundles. Loose newspapers cannot be picked up.

3. Put the bundled newspapers at the curb in front of your house on the day they will be picked up.

4. Only put out newspapers. Remember what we told you on page 2. Different papers cannot be recycled together. Don't put magazines or other kinds of papers into the bundles.

5. Tell your family and neighbors about this experiment. Put up posters in school to tell your classmates about newspaper recycling.

YOU CAN LEARN MORE BY YOURSELF

Write to Eco-News for more information about recycling. Ask for samples of recycled paper and instructions on how to make your own recycled paper. Send a stamped, self-addressed envelope.

OUR THANKS to the Environmental Protection Administration in New York City for helping us to print this newsletter. If you would like more information about how you can help E.P.A. fight pollution, write to: Environmental Protection Administration, Office of Citizen Involvement, Municipal Building, New York, N.Y. 10007.

THIS IS 100% RECYCLED PAPER.

Type 2 Activities:

ANALYZE the information contained in the two articles.

1) Differentiate between recycling paper as described in Eco-News and making paper as described in Gifted/Talented Education.
2) Distinguish between the ingredients used in recycled paper and the ingredients used in making paper.
3) List all the types of paper you can think of. Group these types of paper by texture, use, cost, popularity, etc.

Type 3 Activities:

INVESTIGATE the following alone or in a group:

1) Is the recycling project described in Eco-News still in existence? Write to the Environmental Protection Agency in New York City and find out. Present the results of your research to your class and to the class in Wichita, Kansas who made paper.
2) What are the "recipes" for different types of paper? Write to a paper mill and find out. Then try to make different types of paper using the recipes. Send the results of your project to the Environmental Protection Agency.
3) Will a member of a paper company, paper mill, or EPA come in and talk to your class? Write and find out.
4) Report on "Something for the Trees..Something for the City." (P. 125)

TOPIC: WEATHER REPORT/SETTING UP A WEATHER STATION

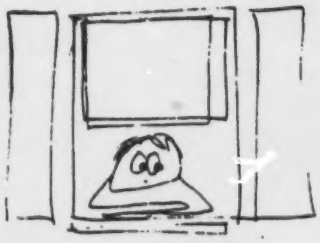
Articles are reprinted from Eco-News, The New York Times, and Natural History Magazine with thanks.

ECO-NEWS
environmental newsletter for young people

235 E. 49th St. New York NY 10017 486-9550

VOL. 5. NO. 7 MARCH, 1975

Weather Report



How do we know what kind of day it is? Our eyesight tells us when it's sunny. We can hear the rain. With our senses of touch, we can feel how hot or cold it is. What are our senses describing to us? It is the weather.

Many different things go together to make weather. Can you have rain without clouds? Does a storm have winds? Do you see the sun on a bright, hot day? Sun, wind, clouds, rain -- all of these make weather by affecting the air and water around us every day.

We can't ignore the weather. Often it forces us to change our plans. When it's very cold, we don't play outdoors. Ballgames can be rained out. Airports can be closed down by fog. Even a whole city can be shut down by a hurricane.

Weather affects people, but people also sometimes affect the weather. When many people live closely together in cities, they cause great changes in the natural things around them. Weather is one of the natural things that has been changed by city life.

This issue of Eco-News is all about weather and the city. As you read it, you will begin to understand how weather happens, how it affects our lives, and how we are affecting weather.

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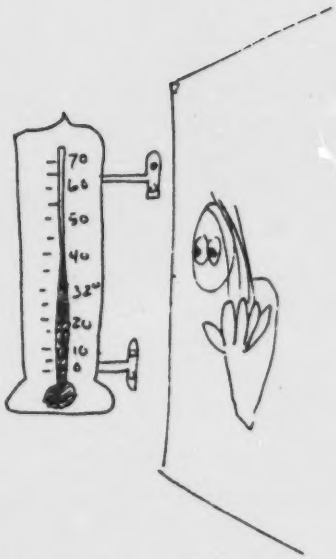
What Makes Heat?



The most important thing about weather is heat. We measure heat by taking its temperature with a thermometer. The more heat, the higher the temperature. We feel much warmer when the thermometer measures 90°F. than when it measures 30°F.

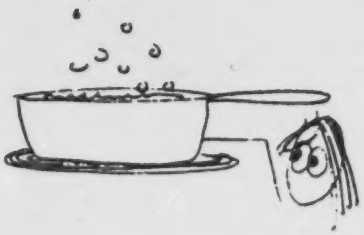
Heat is a form of energy, and like all other energy, it comes from the sun. The sun's hot gases give off heat energy and light energy. Between the earth and the sun is a great distance of empty space, called a vacuum. Heat energy cannot travel directly across a vacuum. But light energy (sunlight) can easily cross the vacuum and change to heat energy after it gets to our earth.

When sunlight reaches the earth, some of it is bounced away by reflection. Sunlight is brightly reflected by shiny or light-colored surfaces. Think of the white sand at the beach. Doesn't the sunlight look brighter at the beach?

Some sunlight is not reflected away from earth. It is absorbed into the ground or water. Then its light energy changes to heat energy. This is how the sunlight warms our earth.

How Does Heat Make Weather?

The heat from the sun causes the earth's air and water to change temperature and move. When air becomes warm, it rises. You can see the moving air rippling above a fire or hot radiator.



Warm water also moves. As the water (liquid) in a pan heats up, it bubbles and some of it changes to rising steam (vapor).

Warm, moving air creates winds. Winds blow in certain directions because some parts of the earth warm up faster than other parts. During the day, the seashore heats up more quickly than the ocean. The air above the land becomes warm and rises. The cooler air over the ocean moves toward the land to take the place of the warmer air. So ocean breezes are then created.

Other, bigger winds often begin at the hottest part of the earth -- the equator. There, direct sunlight makes the air very warm. The air rises and moves toward the North and South Poles. The Poles, as you know, receive the least amount of direct sunlight. Their cold air moves toward the equator to replace the warm, rising air. So the earth's winds move around the world by the energy of heat.

More about Heat and Weather

When the earth's water absorbs the sun's heat, some of it becomes so warm that it changes from liquid into vapor, just as in the pan of heated water. As the warm vapor rises, there will be less liquid left. This is called <u>evaporation</u>.

As the warm air rises, it begins to cool. Its water vapor changes back to liquid. This is <u>condensation</u>. You can see condensation at work when hot air hits a cold window -- there will be a film of water on the glass.

Water vapor condenses onto dust and dirt specks that float in the air. The water droplets that are formed collect together to become clouds. When enough droplets have joined together, they can become heavy enough to fall as rain.

Often the temperature in the clouds is below freezing. The cloud droplets freeze to form tiny ice crystals. When the crystals join, snow is made. If the air temperature from the clouds to the ground is below freezing, snow will fall.

If you are ever on the top floors of a skyscraper, you may observe an interesting thing. The air is colder there than it is at street level. So people who work on the top floors may see snow falling that will be melted into rain by the time it reaches the street.

4

How Do Cities "Make" Weather?

Cities can affect their weather by making it hotter. In large cities, many machines are used to make, move, heat or cool things. As machines use energy, they produce a lot of waste heat. So cities can become heat islands. They are much warmer than the countryside, especially at night. Listen to the weather reporters on TV or radio. Almost always, the temperature in the cities is slightly higher than in the country.

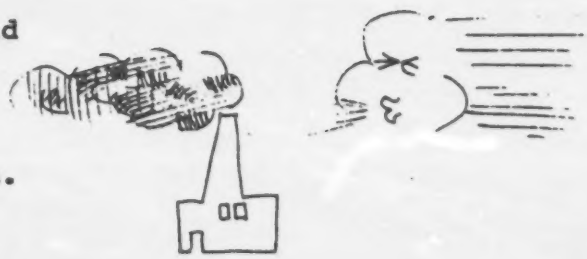
There is another reason why cities are hotter.. As cities grow, they replace forests and fields with asphalt and concrete. Asphalt streets and concrete sidewalks absorb more sunlight than forests and fields do. Then they become like ovens, giving off their heat for hours, especially at night.

Since cities are heat islands, they are sources of warm, moist air. As this air rises and cools, it forms cloud droplets around the many dirt specks of the cities' polluted air. So cities may have more cloudy weather than the country.

Some scientists think that large cities can act as rainmakers for places near them. It has been found that the rainfall is heavier in places that receive the winds from large cities. Can you explain how this could happen?

How Does Weather Affect Air Pollution?

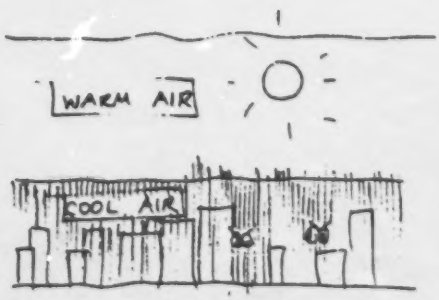
Weather can help cities get rid of air pollution. Most of our air pollution is produced in large cities, and the air in many places is getting dirtier all the time. Winds can help remove air pollution. They can blow away air that has become dirty from pollution.



The winds also force the pollution to mix with cleaner air they bring in. This reduces the amount of air pollution there is in one place.

While the winds remove air pollution from the cities, the rain washes the winds. The rain captures the soot and gases and carries them to the ground. This makes the winds much cleaner, but it may make the rain very dirty.

Sometimes the weather can make air pollution far worse. One good example is a <u>temperature inversion</u>. In normal times, cold air from above mixes with warm air from below. This keeps the air moving and helps to clean it. But when an inversion comes, warm air sits on top of cooler air, and keeps it from moving. Then pollution is trapped in the cooler air at the ground. Air pollution can become very bad. Sometimes people can become sick.



You Can Be a Weather Observer

Understanding the weather is sometimes very difficult. Try some of the experiments below. They will help you remember some of the things you have learned about the weather.

1. MEASURE REFLECTION AND ABSORPTION OF SUNLIGHT.

*Materials needed: 5 thermometers

Leave a thermometer on a sidewalk, under a tree, on a sunny lawn, in a sandbox, and in a large bowl of water placed outside. Let them stay in place for an hour. What temperature does the thermometer measure at each place? Which places have cool temperatures? Which places are the warmest? What does this tell you about the reflection and absorption of sunlight?

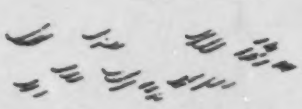
**NOTE: Be sure to do all parts of this experiment on the same day.

2. PREDICT WEATHER FROM CLOUDS.

*Materials needed: notebook and pencil

Observe the three types of clouds. You will see clouds that are heaped up (cumulus), clouds that are wispy (cirrus), and clouds in large sheets (stratus). Each one is caused by a different kind of weather. Keep a list of the clouds you see, a list of what the weather was when you saw them and a list of what the weather was two hours later. After two weeks, read what you have written. What do you notice? Could you start predicting what the day's weather will be by observing clouds?

CUMULUS



CIRRUS

STRATUS

3. SAMPLE THE AIR.

*Materials needed: piece of heavy paper
clear tape

Punch a hole in the middle of the piece of paper. Put a strip of clear tape over the hole. Make sure some of the sticky surface shows through the hole. Leave the paper outside for two days. Then look at it with a magnifying glass. What was caught on the tape? Sample the air in several places. Do you catch the same things on the tape?

The above experiment was taken from The Conservationist, a publication of the New York State Department of Conservation.

Thank You

Many thanks to Roger Guttentag and Nancy Wolf for writing this issue of Eco-News.

TEACHERS: Get a free teacher's guide.

For a free teacher's guide to this newsletter, send a stamped, business-size, self-addressed envelope to Eco-News. Please note volume and number of issue.

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Illustrator: Susan Bingham

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ECO-NEWS TEACHER'S GUIDE

Volume 5, Number 7

WEATHER REPORT

In this issue of Eco-News, we present the first of a two-part exploration of weather and climate. The April issue will focus on climate around the world, and the relationship of climate to people and cities.

The weather issue has two main aims. One is to reinforce and supplement the students' other materials on weather as they work within their science curriculum. In addition, we are exploring with them the environmental effects of weather on cities, and of cities on weather.

We have developed our explanation of how weather is made around the concept of heat energy. It is this moving energy of the sun that changes the temperature of air and water to create all weather. If the students can be helped to see weather in a total picture, we feel that there will be a greater understanding of its causes and effects.

The subject of the environmental aspect of weather is one that has been of increasing interest to scientists and environmentalists. We hope this issue will introduce some of the major ideas to the students and stimulate them to follow the new information that will be increasingly evident as this research continues. It will be a new way of looking at weather.

The weather issue may become a way to introduce the whole concept of energy in its many forms. If your class is interested in pursuing the energy subject in depth, there are three back issues of Eco-News that are available: "How Energy Affects Your Life", Vol. IV, No. 3; "How Should We Use Energy?", Vol. IV, No. 5; and "Energy From The Sun", Vol. IV, No. 9. These issues discuss the source of energy, the different ways we use it today, and the need for conservation of present sources and development of new forms for the future. Copies of these issues are available from EAC at 10¢ per copy.

We hope that your students will enjoy doing the experiments in this issue and will learn many weather concepts from the suggested investigations. Here are some additional experiments that we could not include because of space limitations:

1. Measure the amount of heat energy absorbed by ground and water.
   Materials needed: 2 bowls of equal size, gravel, water, and 2 thermometers.

Fill one bowl with gravel and the other with water. Place a thermometer in each bowl. Leave the two bowls either in direct sunlight or under a strong lamp. After two hours, check the temperature of each bowl. Which bowl is warmer? Why?

This paper is made from reclaimed waste

2. Check the movement of warm air.
Materials needed: 2 thermometers

Place one thermometer on the floor and hang the other near the ceiling. Check and record the temperature of each. After two hours, check their temperatures again. Which one is warmer? Why? In which direction does warm air usually go?

3. Check the relationship of heat and light.
Materials needed: 2 thermometers

Check the temperature on two thermometers. Record it. Place one thermometer in a sunny room. Place the other in a dark room. Be sure that both rooms are about equal in size. In two hours, check the temperatures of both thermometers. Which one is warmer? Why?

4. Create condensation.
Materials needed: 2 panes of glass, or any other glass surface, a steam kettle.

Heat some water in a steam kettle. When it is boiling, hold one of the glass panes over it. What do you see? How does the water collect on the glass pane? Warm one pane and cool the other. Then hold both over the steam from the kettle. Which one has condensation first? Is there more water on the warm or cool glass pane? Why?

The students may want to read further on the subject of weather. Here are some suggestions:

Tillie S. Pine and Joseph Levine: Weather All Around. McGraw Hill, New York. 1966

Eve Marie Iger: Weather On The Move. Young Scott Books, New York. 1970

Ben Bova: Man Changes The Weather. Addison-Wesley Publishing Company, Inc. Reading, Mass. 1973

For more information for your own research, we suggest:

Dept. of Commerce, Publications Section
Environmental Science Services Administration
Washington Science Center - Building 2
Rockville, Maryland 20852

Weather Center - The Franklin Institute
Benjamin Franklin Parkway at 20th Street
Philadelphia, Pennsylvania 19103

NASA
Broadway and West 112th Street
New York, New York

Type 3 Activity:

Setting up a weather station in your classroom

1) Bring in The Daily News and The New York Times. Chart the forecast on a graph. Compare with what the weather is like each day. Keep a record for a month.
2) Bring in pictures of clouds from magazines. Group them according to weather type. Study the clouds daily for an extended period of time. Report your results in comparison with type of weather cloud should indicate.
3) Write to Dr. Frank Field of NBC News about your weather station. Ask if you may visit NBC to see how the weather forecast is done. Write to other meteorologists, including NASA at Broadway and West 112th Street, in New York City.
4) Study the weather in other parts of the country and the world. Compare and contrast it with ours. How and why is it alike/different? Chart your results.
5) Find articles in newspapers and magazines on other types of weather conditions and climate. Report on these articles to the rest of the class. (e.g., "The Structure of a Hurricane" from Natural History, October, 1973.)
6) Keep a record of the weather for a month, including temperature, cloud formation, precipitation, wind. Chart all of the above. Compare with other years.

Weather Reports and Forecast

Summary

Partly sunny skies, accompanied by unseasonably mild temperatures, will return today to the northeastern quarter of the country. However, flurries of showers are possible from extreme northern New England into eastern and northern sections of the lake region. Additional precipitation will be limited to rain in the Middle Atlantic States, and scattered rain—with snow in the mountains—from northwestern edges of the Plains States to the northern third of the West Coast. It will be clear to partly cloudy elsewhere. Colder air will sweep across the lower lake region and Appalachians into the Middle The Southern Plains and cen- and South Atlantic States. tral Rockies will be warmer while elsewhere, seasonably cool conditions will continue.

Skies remained cloudy yesterday across much of the country; skies were fair only from the southern half of the Mississippi Valley across portions of the Plains States and the southern Rockies into the Southwest. Rain occurred from the Northeast across the lower lake region into lower Michigan, while showers and a few thundershowers soaked the coast of the South Atlantic States. Snow continued from upper Michigan into the eastern Dakotas—several areas recorded heavy accumulations. Snow-showers and flurries spread south into Iowa and eastern Nebraska, as light snow fell in the Texas panhandle.

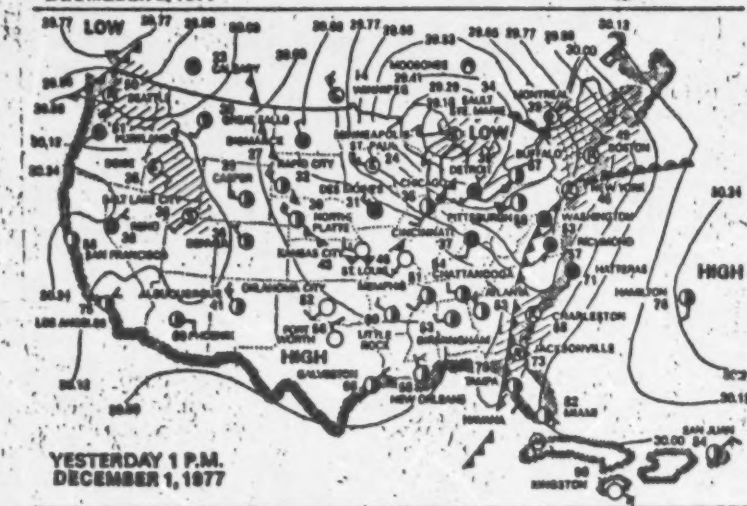


Figure beside Station Circle is temperature.

Cold front: a boundary between cold air and warmer air, under which the colder air pushes like a wedge, usually south and east.

Warm front: a boundary between warm air and a retreating wedge of colder air over which the warm air is forced as it advances, usually north and east.

Occluded front: a line along which warm air was lifted by opposing wedges of cold air, often causing precipitation.

Shaded areas indicate precipitation.

Dash lines show forecast afternoon maximum temperatures.

Isobars are lines (solid black) of equal barometric pressure (in inches), forming air-flow patterns.

Winds are counterclockwise toward the center of low-pressure systems, clockwise outward from high-pressure areas. Pressure systems usually move east.

Forecast

National Weather Service (As of 5 P.M.)

METROPOLITAN NEW YORK, LONG ISLAND AND NORTH JERSEY—Partly sunny, unseasonably mild today, high from the upper 40's west inland to the low to mid-50's along the coast; winds westerly about 10 miles per hour today, and variable about 5 m.p.h. tonight; cloud tonight, low in the upper 30's to low 40's. Partly sunny, continued mild tomorrow. Precipitation probability 20 percent today, 10 percent tonight. Visibility on the Sound five miles or better.

SOUTH JERSEY—Partly sunny today, high in the upper 40's to mid-50's; fair, cold tonight, low in the mid to upper 30's. Fair, unseasonably mild tomorrow.

INTERIOR EASTERN NEW YORK AND VERMONT—Variably cloudy today with chance of some showers north, high in the 40's to low 50's; partly cloudy tonight with chance of flurries north, low in the 30's. Partly sunny, colder tomorrow.

CONNECTICUT, RHODE ISLAND AND MASSACHUSETTS—Partly sunny, breezy but mild today, high in the mid to upper 50's; fair tonight, low in the mid-30's. Increasing cloudiness, cooler tomorrow.

NEW HAMPSHIRE AND MAINE—Partly sunny, windy today but with flurries possible in northern and mountain areas, high in the 30's north and the 40's south; fair tonight, low in the teens to near 20 north, and in the 30's to near 30 south. Fair, colder tomorrow.

Extended Forecast

(Sunday through Tuesday)

METROPOLITAN NEW YORK, LONG ISLAND AND NORTH JERSEY—Mostly cloudy with chance of showers Sunday and Monday; becoming fair Tuesday. Unseasonably mild; daytime highs will average in the upper 40's to low 50's, while overnight lows average in the upper 30's to low 40's.

Sun and Moon

(Supplied by the Hayden Planetarium)

The sun rises today at 7:02 A.M.; sets at 4:29 P.M.; and will rise tomorrow at 7:03 A.M.

The moon rises today at 10:56 P.M.; sets tomorrow at 12:04 P.M.; and will rise tomorrow at 11:57 P.M.

Nov. 25 Full	Dec. 3 Last Qtr.	Dec. 10 New	Dec. 17 First Qtr.

Yesterday's Records

Eastern Standard Time

	Temp.	Hum.	Winds	Bar.
1 A.M.	42	93	NE 16	29.91
2 A.M.	42	93	NE 17	29.84
3 A.M.	43	93	NE 13	29.80
4 A.M.	43	93	NE 13	29.77
5 A.M.	44	93	NE 20	29.73
6 A.M.	45	93	N 10	29.74
7 A.M.	45	93	NE 13	29.72
8 A.M.	45	93	NE 11	29.71
9 A.M.	45	93	NE 10	29.71
10 A.M.	45	96	NE 7	29.72
11 A.M.	45	96	NE 8	29.70
Noon	45	100	NE 8	29.66
1 P.M.	45	100	NE 6	29.64
2 P.M.	46	100	NE 5	29.62
3 P.M.	46	100	NE 6	29.61
4 P.M.	46	96	N 5	29.62
5 P.M.	46	96	NNE 8	29.61
6 P.M.	46	96	NE 6	29.63
7 P.M.	47	96	NNW 5	29.65

Temperature Data

(19-hour period ended 7 P.M.)

Lowest, 43 at 12:06 A.M.
Highest, 47 at 6:40 P.M.
Mean, 45.
Normal on this date, 41.
Departure from normal, +4.
Departure this month, +4.
Departure this year, +1.
Lowest this date last year, 18.
Highest this date last year, 30.
Lowest temperature this date, 10 in 1875.
Highest temperature this date, 68 in 1963.
Lowest mean this date, 17 in 1887.
Highest mean this date, 55 in 1952.
Degree-days yesterday, *20.
Degree-days this month, 20.
Degree-days since July 1, 906.
Normal since July 1, 791.
Total last season to this date, 1,154.
*A degree-day is a symbolic unit calculated to measure heating-fuel requirements. The daily degree-day figure equals the number of degrees the mean temperature has fallen below 65.

Precipitation Data

(24-hour period ended 7 P.M.)

Twelve hours ended 7 A.M., **
Twelve hours ended 7 P. M., **
Total this month **
Previous total since Jan. 1, 12.36.
Normal this month 3.53.
Days with precipitation this date, 21 since 1869.
Least amount this month, 0.25 in 1925.
Greatest amount this month, 9.98 in 1972.
**Total not available from the National Weather Service at Central Park, Al La Guardia Airport 19-hour period ended 7 P.M., 0.76.

Planets

NEW YORK CITY
(tomorrow, E.S.T.)

Venus—rises 6:03 A.M.; sets 3:49 P.M.
Mars—rises 8:44 P.M.; sets 11:21 A.M.
Jupiter—rises 5:49 P.M.; sets 8:54 A.M.
Saturn—rises 10:28 P.M.; sets 12:07 P.M.

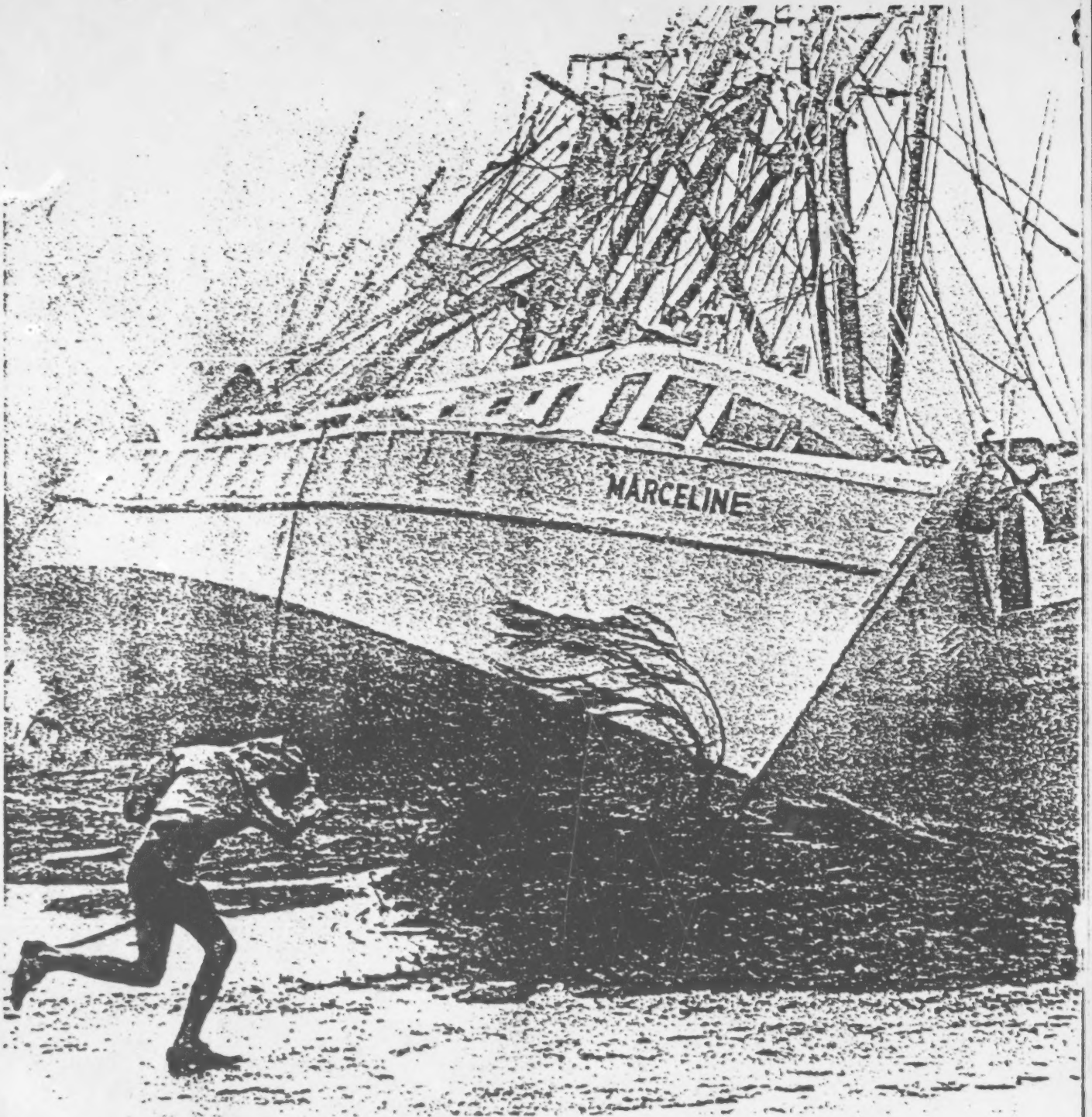
Planets rise in the east and set in the west, reaching their highest point on the north-south meridian, midway between their times of rising and setting.

THE WEATHER REPORT from The New York Times

HURRICANES

from Natural History Magazine

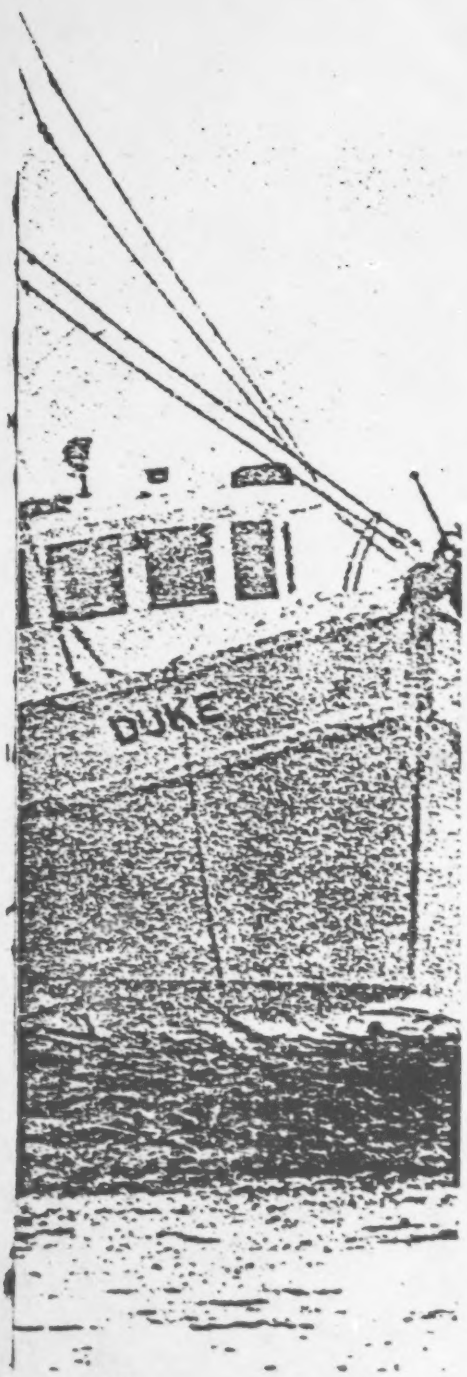
October 1973



Disaster from the Tropics

The dynamics of hurricanes—from birth to maturity—suggest ways in which the most destructive storms on earth might be modified

by R. Cecil Gentry



"A man on Long Island had satisfied a lifelong ambition by ordering an expensive barometer from Abercrombie & Fitch. It arrived the morning of September 21st. Eagerly, he unwrapped it and was disgusted to find the needle stuck at 'Hurricane.' After shaking it in a vain attempt to start it working right, he sat down, wrote a very stuffy letter to A. & F., and went right out to mail it. When he returned, his house was gone, and the barometer with it."

From *The New Yorker*
November 12, 1938.

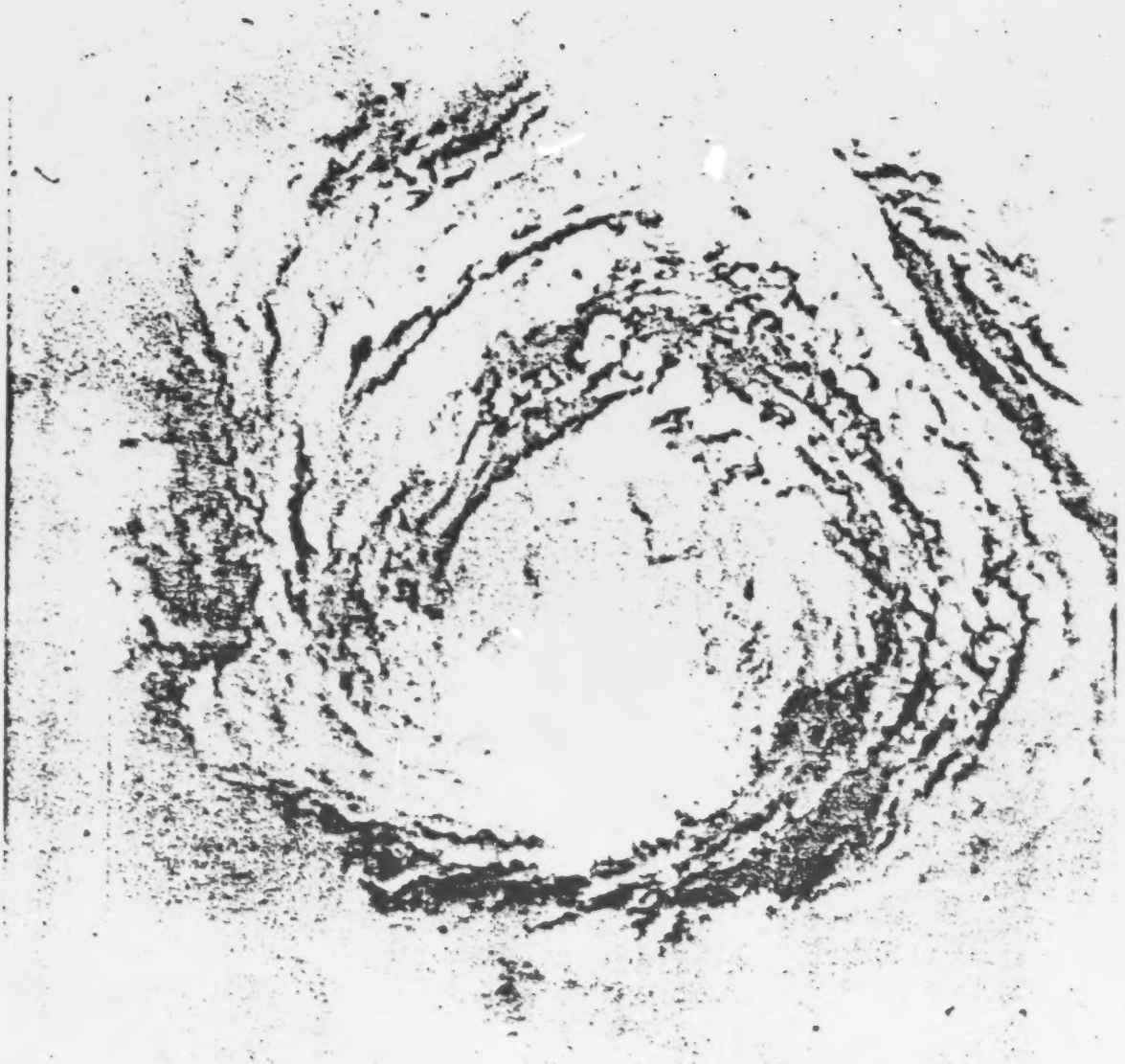
That incident took place as a hurricane with winds of 100 miles an hour roared up the Atlantic coast from Cape Hatteras, North Carolina, to Nantucket Island, Massachusetts—far north of the usual hurricane belt—toppling trees, destroying buildings, sweeping cars off the roads and trains off their tracks, causing thirty-foot waves, and leaving a toll of about 600 dead, 2,000 injured, and half a billion dollars' worth of damage.

One to three hurricanes usually strike the United States annually. Improved detection techniques and warning systems have greatly reduced the number of deaths hurricanes cause, but because of increased coastal development, property loss has risen. Hurricanes Betsy in 1965 and Camille in 1969 created more than $1.4 billion damage each; in 1972 hurricane Agnes was responsible for $3 billion property damage.

Almost all countries lying on the western sides of the oceans, especially those in or near the tropics, have experienced disasters resulting from these violent storms. The devastation outside the United States is often even more catastrophic than in this country. In 1970 three typhoons, as hurricanes are called in the western Pacific, that hit the Philippines within a few weeks made the difference between a growing economy and one struggling merely to survive. That same year a tropical cyclone (still another name for a hurricane used in some parts of the world) swept in from the Bay of Bengal across the low-lying islands of Bangladesh and killed about 300,000 persons, mainly by drowning.

Hurricane damage results from three principal factors: the destructive force of the wind; the storm surge, or rise of the water level along the coast as a hurricane moves inland; and the floods caused by torrential rains, which can average six to twelve inches in a period of 24 hours or less.

Hurricanes, among the most destructive weather phenomena on earth, originate over warm, seem-



ingly peaceful tropical waters. By definition, they have winds stronger than 74 miles per hour. Maximum winds, however, vary from storm to storm and have been known to reach velocities of 150 to 200 miles per hour.

Although all the conditions necessary to change a mild tropical disturbance into a full-scale hurricane are not entirely understood, we can draw a portrait of a mature tropical cyclone. A fully developed hurricane may cover an area 300 to 400 miles in diameter and last from one to thirty days. Its most unusual feature is the eye, or storm center: a region of low pressure, relatively calm winds, temperatures 10 to 15 degrees warmer than the surrounding air, little or no precipitation, and only a few clouds. The diameter of a typical eye is about fifteen miles. Around this comparatively peaceful core, towering clouds form a wall in which the storm's heaviest rainfall, maximum winds, and most intense turbulence are located. These eye-wall clouds have bases about 500 feet above the sea's surface and tops that reach 40,000 to 50,000 feet.

The wall clouds are themselves surrounded by a great expanse of active rainbands, lines of clouds with greater than average vertical development and often intense rain, which spiral from the outside inward toward the center of the storm. These rainbands are the principal way a hurricane can be identified on a radarscope or in a satellite picture. They indicate the paths of the winds that carry warm, moist air into the storm's structure. It is the latent heat in this moist air that powers a tropical cyclone.

Meteorologists liken a hurricane to both a giant pump and an enormous heat engine. The storm sucks up large masses of essential moisture-laden air at low levels, swirls it upward, and expels it at great heights. As the incoming warm air rises through the eye-wall and neighboring rainband clouds, it expands and cools, its water vapor condenses into droplets, releasing its latent heat and making available huge amounts of energy. In a mature hurricane, as much as several quadrillion pounds of this air flow into the storm circulation every twenty-four hours; more than 80 percent of the water vapor in the air condenses and eventually falls from the storm as rain. In the condensation process, quintillions of calories of latent heat are released. In a single day a moderately intense hurricane often releases as much heat energy as would be released in the simultaneous detonation of 400 twenty-megaton hydrogen bombs. If converted to electricity, that amount of energy would be sufficient to supply all the electrical needs of the entire United States for more than six months. Furthermore, hurricanes release this energy day after day until they weaken and dissipate—a period that averages a week.

Fortunately, the hurricane, although powerful, is a rather inefficient heat engine; only between 2 and 4 percent of its enormous heat energy is converted into kinetic energy, the energy of motion. But the total heat energy released is so great that even this small percentage is enough to produce the hurricane's fiercely destructive winds.

Forces with the magnitude of those in a hurricane cannot be overcome by direct confrontation. Research into possible man-made hurricane modification has therefore been devoted to finding the hurricane's Achilles's heel, interrupting its complex interrelationships, and learning how to trigger a chain of events that will make the storm work against itself.

Knowledge needed for studies of hurricane modification was not acquired until after regular aircraft reconnaissance of these storms was initiated by United States military services in 1944. Although those early observations were directed primarily toward tracking hurricanes and measuring their maximum intensity, many airborne observations provided details about wind, pressure, and cloud structures. Since 1955, highly instrumented research aircraft have made periodic flights through hurricanes, recording data as often as once per second. In recent years meteorological satellites have also contributed information on hurricanes in the formative and mature stages. In addition, theoretical and numerical models that simulate many features in the life history of tropical cyclones have been developed. By using these models to supplement and interpret the hurricane data that have been collected directly, many of the things that must be known before successful modification experiments can be conducted have become better understood.

In the tropics, winds are normally rather light and pressure and temperature are usually uniform over great distances. In a hurricane, however, the winds are strong and the pressure and temperature change rapidly with distance and altitude. Therefore, the two main questions to be answered are what makes hurricane winds so violent and what accounts for the changes in pressure and temperature? The same set of interlocking relationships explains both these phenomena in a fully developed hurricane, an almost self-perpetuating system.

Air pressure in a hurricane is high at the periphery and low at the center. Just as water runs downhill, air rushes inward from high- to low-pressure areas. The greater the pressure difference, the stronger the winds will be. The converging air rises around the eye in a whirling column of winds. When the moisture in this air condenses, it releases heat energy that warms the air at the core. As the air around the eye ascends, some air within and near the eye descends. Compressional heating as the air flows downward causes additional warming in the eye region. The net result is a pool of warmer air near the core of the storm. This warm pool, extending through much of the depth of the atmosphere, contrasted with the air of normal temperature toward the periphery, causes the

The eye of a hurricane, an area of relative calm, is seen from an Air Force plane monitoring the storm to gather meteorological data.

pressure gradient to be strong, which, in turn, keeps the winds blowing. As long as there is plenty of warm, moist tropical air to flow in toward the center of the storm, and the ocean is warm enough to keep supplying heat and water vapor to this air, the hurricane has the potential of maintaining itself indefinitely. In actuality, many tropical cyclones sustain a high level of intensity for periods of five to twenty days, as long as they stay over warm waters. Over cold water or land, hurricanes decay rapidly.

This chain of events not only explains the mechanisms by which a hurricane maintains its energy levels, but also suggests potential weaknesses that might be exploited in attempting to alter the hurricane artificially. For example, if the warm pool of moist air over a large expanse of ocean could be dispersed or the inflow of that air slowed, it would be possible to reduce the storm's intensity. If the transfer of energy from the ocean to the atmosphere inside the hurricane could be stopped, the storm could be moderated. Or if the pressure and temperature gradients could be reduced by other means, the hurricane could be tempered.

Various suggestions concerning ways to change the temperature field have, in fact, been made. First, since the warm core is primarily produced by the latent heat released in the air columns rising near the eye of the storm, temperature could be affected by reducing the water vapor in those columns. Studies of the structure of hurricanes indicate that part of the vapor condensed in these rising columns is evaporated from the ocean inside the high wind area of the hurricane. This has led to the suggestion that a chemical film be spread over the ocean to reduce evaporation. Theoretical models of hurricanes indicate that stopping evaporation of water from the ocean to the atmosphere inside the hurricane would indeed reduce the intensity of the storm quite dramatically—by more than 50 percent within 24 hours. Unfortunately, there is no known film capable of suppressing evaporation and strong enough to persist in the high waves and furious winds of a hurricane.

Another suggestion involves cooling the ocean water in advance of the hurricane. This could mean bringing cold water up from the ocean depths to mix with warm water at the surface, towing icebergs into hurricane areas, and other equally imaginative, but impractical, approaches. They all depend, among other things, on knowing the exact track of a hurricane several days in advance, information not now available.

Still another suggestion is to drop solid or liquid carbon dioxide in the eye and wall clouds to cool the air in the inner core of the storm. A variation of this is to drop urea in the wall clouds. The urea would combine with the water in the clouds, taking heat from the air and thus reducing the temperature. Calculations indicate that about 100 aircraft would be required to carry enough of either of these compounds to reduce the temperature even one or two degrees centigrade, and many would have to be in the storm's core at the same time. This would obviously be an unsafe operation.

Finally, there are the logistically practical suggestions that offer realistic possibilities for successfully modifying hurricanes. These involve modifying the mechanism by which heat is distributed through the storm. This is the approach adopted in the Project Stormfury experiments carried out jointly by the National Oceanic and Atmospheric Administration and the U.S. Navy and Air Force.

Supercooled water—water that remains liquid even though the temperature is below the freezing point—is found in the clouds at the tops of mature hurricanes. This water provides an opportunity for modifying the heat-release processes and, in turn, the interaction between the clouds and larger scales of air circulation. Water drops in clouds do not automatically freeze when the temperature is below 0°C. A freezing nucleus must be present for the water to turn to ice unless the temperature is as low as –40°C. Ice crystals make excellent freezing nuclei, and there are many other natural substances that serve this purpose. In hurricanes, however, there is often a deficiency in ascending air currents of freezing nuclei that are active at temperatures below the normal freezing range. If freezing nuclei are artificially introduced into the building clouds by the technique known as cloud seeding, the supercooled water droplets will turn into ice. The phase change from liquid water to ice causes a release of the latent heat of fusion.

If this process takes place in a sensitive region of the hurricane, it may cause significant changes in the storm. For example, studies of hurricane structure and, in particular, results from experiments with hurricane models, suggest that heat added in areas outside the radius of maximum ascending motion, the eye wall, can cause reduction in the maximum winds of the hurricane.

A second result of cloud seeding also selectively adds heat to a storm. Experiments have shown that under certain vertical temperature and humidity distributions, seeded clouds will grow more than they would have grown naturally. As they grow, more water is condensed and much greater quantities of latent heat are released. Calculations with theoretical models indicate that this heat of condensation released by augmented cloud growth would be many times greater than the heat of fusion released by freezing of the existing water alone. Furthermore, indications are that a new eye wall can be developed if the growth of clouds can be encouraged in the inflowing air several miles beyond the original eye wall. Inflowing air at sea level could then ascend through the new eye wall to the outflow layer at the top of the storm, and the farther away from the center of the storm the air ascends, the more the wind speeds will be moderated. Thus, developing a new eye wall by seeding clouds radially outward from the old eye wall may provide a mechanism for reducing the maximum winds in a hurricane. The process would also serve to release the latent heat at a greater distance from the center, thus reducing the temperature and pressure gradients.

Experiments to modify hurricanes, which began in 1961, have

all used silver iodide crystals dispersed from aircraft as the freezing nuclei. These seeding experiments seek to reduce the maximum winds by dispersing over a larger area the energy that normally is concentrated in a relatively narrow band curving around the center of the storm.

The force of the wind varies with the square of the wind speed. This means a wind of 100 miles per hour exerts four times as much force as a wind of 50 miles per hour. Similarly, a reduction in the maximum wind speed of 10 percent would mean a reduction in the force of about 20 percent.

The area in which hurricane modification experiments can be conducted is quite restricted. The aircraft used in the Stormfury experiments have been based in Puerto Rico and Florida. Since the planes remain in the air for several hours while monitoring a storm, the hurricanes selected must be within 700 miles of an operating base. To lessen the possibility of litigation involving liability should a seeded storm suddenly veer inland, and because proximity to land modifies the properties of hurricanes, those deemed eligible for experimentation must have only a 10 percent probability or less of coming within 50 nautical miles of a populated area within eighteen hours after seeding. In addition, the storm must be fully mature rather than already weakening, and the clouds must contain ample amounts of seedable supercooled water. In view of these qualifications, it has been possible to experiment with seeding on only four hurricanes since the program began twelve years ago. The principal data used in evaluating those experiments were the measured winds and the observations of the size of the eye. The results were encouraging but not conclusive.

It is relatively simple to drop silver iodide in the clouds. It is not much more difficult to measure how the storm changes with time. But hurricanes are naturally variable. The expected reduction in maximum winds from seeding experiments is about 10 to 15 percent. Many storms have changes of equal magnitude due to natural variations. The real problem is establishing beyond doubt that a reduction of 15 percent was effected by the seeding, independent of natural changes.

One suggestion is to design a randomized experiment in which some storms, selected by chance, are seeded and some are used as controls. Unfortunately, such an experiment requires a large number of storms. Since one of the biggest problems Stormfury has faced to date has been inadequate opportunity for experimentation, the project has sought other means of evaluating the experiment, namely the development of theoretical hurricane models. They have made it possible to calculate the expected effect of seeding and to design a better means of evaluating the experimental results.

In conducting any experiment in artificial weather modification, possible harmful side effects must be considered. Concern has been expressed over possible effects on rainfall, the storm's track, general circulation of the atmosphere, and potential damage to plant and animal life caused by the silver iodide.

Many areas of the world depend on rainfall from tropical cyclones to alleviate drought, fill reservoirs, and satisfy other water requirements. An often raised question is whether modifying a hurricane will significantly affect rainfall patterns. The data collected in modification experiments to date, although inadequate to answer this question fully, do not indicate that the experiments had any significant effect at all on the rainfall. Theoretical models suggest that seeding will cause a small increase in the total rainfall in the storm, but that the rainfall will also be more widely distributed. If future field experiments confirm these indications, the effects would be beneficial. That is, the semiarid regions of the world would continue to get the needed rain from modified tropical cyclones without an increased probability of floods in other areas.

Those concerned about rainfall also ask if the experiments will change the course of the storm and take the needed rainfall to an entirely different area. All research on predicting hurricane tracks suggests

The circular motion of the air converging around the storm's eye is due to the rotation of the earth, which deflects winds north of the Equator to the right, those south to the left.

that the modification would have little, if any, effect on the direction of motion of the storm. This problem can only be studied with a full three-dimensional model of a hurricane that includes interaction with the environment. Work is under way on such a model.

Future hurricane-seeding experiments are not expected to have any noticeable effect on the general circulation of the atmosphere either. To bring about such a result, the experiments would have to destroy the hurricane, change its track, or affect its rainfall. No significant changes are anticipated in any one of these areas.

Finally, evidence accumulated so far has not shown any harmful effect on either animal or plant life caused by the silver iodide used for seeding. In fact, one of the big problems in postseeding analyses is finding any traces of silver iodide in the rain water to analyze.

To homeowners, hurricanes, one of the most awesome of natural phenomena, are potential destroyers; to public officials, they are a threat to the community. To scientists, however, they are a problem that appears to be solvable. Hurricane-seeding experiments, the most promising method yet tried for modifying these storms, have been temporarily suspended for two or three years to provide time for procurement of new aircraft and the installation of improved instrumentation. In the meantime, research continues on the physics of hurricane clouds, the interaction between the ocean and the atmosphere in tropical cyclones, the natural variability of hurricanes, and the development of improved numerical models for computer hurricane experiments. The ultimate goal is to tame these greatest storms on earth. □

The usual hurricane season in the United States is from June through November. Areas most often hit are the Gulf states and Florida.

TOPIC: THE MUSEUM YOU LIVE IN/ARCHITECTURE

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THE MUSEUM YOU LIVE IN

What kinds of exhibits can you find in a museum? In some of them, you may find tools, farm and factory implements, or weapons. These things were all needed by people, and were made to be used. But what about art museums? Most of them are filled with paintings and sculpture. These works of art were made by artists to express their own feelings. They can't be used, but they can be enjoyed by others.

Do you know of a museum where all the exhibits were made to be looked at and used at the same time? It's a museum that is part of your total environment. This special museum is made up of all the buildings in your city or town. Together, they form a lived-in museum of architecture.

Each building in your architectural museum has a function. Buildings are used to live in, to work in, to play in, and to shop in. The job of the building's architect is to plan and design a building that will perform its functions in the best possible way.

But besides its useful purpose, a building is also a work of art. Each has its own individual appearance. The way a building looks can make you feel a special way. You may like it or hate it. One building may make you feel free and strong. Another may overpower you with its size and make you feel small and weak. You may feel cozy when you look at some buildings. Others may make you feel lost and lonely.

Look around you when you go outside. Examine the buildings that are so much a part of your environment. What kinds of buildings do you see? How are they being used? And how do they make you feel?

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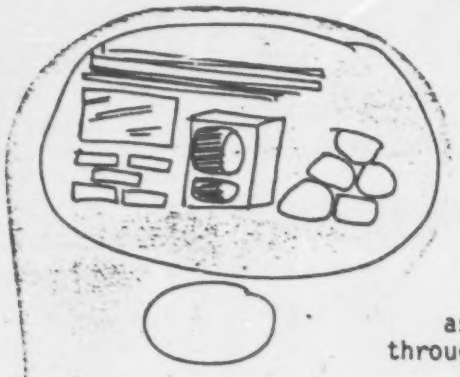
THE ARCHITECT CHOOSES

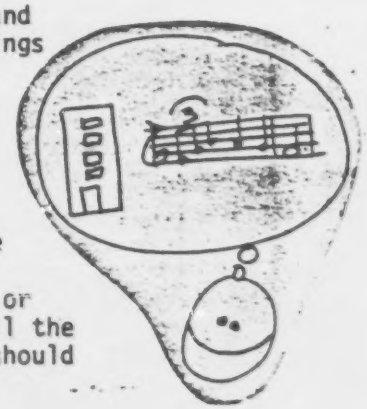
An architect has to think of many things while designing a building. First of all, what kind of building will it be? A school? A supermarket? A two-story house? A church? And what sort of space will the building occupy? Will it stand alone in the open, or will it be closely surrounded by other buildings?



A choice must also be made about the materials to be used. Buildings may be constructed from brick, wood, steel, concrete, stone or glass. Each material has its own appearance. It may be rough or smooth. It may be red, gray, yellowish, black or pink. Glass may be smooth or bumpy. It may be as clear as a window pane or so "milky" that you can't see through it.

The architect's building must have its own form. Should it appear heavy and solid, or should it have a delicate, fragile look? The answers to these questions help the architect make the choice of materials to be used in the building's construction. A wall of big rocks may appear heavier than a smooth concrete one, even though it may actually be lighter in weight. Different materials give the impression of being "hard" or "soft." A smooth, worn stone has a gentler, softer look than a pile of bricks. Rough, unpainted wood seems softer than highly polished glass.

Architecture is a lot like music. Music has rhythm and harmony that make the sounds pleasing to your ear. Buildings have their own special rhythm and harmony. They make the architecture look pleasing to your eye.

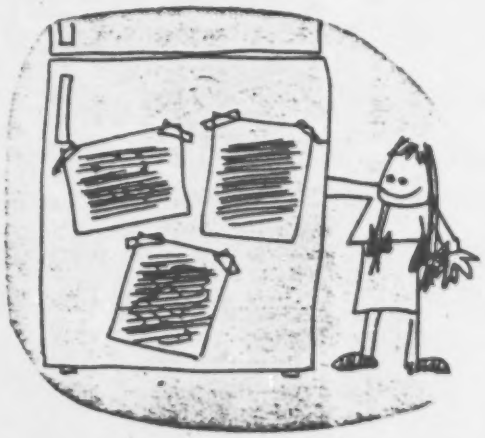


You can feel a building's rhythm by looking it over carefully. Does your eye flow easily from one part of the building to the next? Does the building seem to be put together in a pleasing way? It shouldn't look unbalanced or disconnected. There should be a harmony or blending of all the different parts. Each part, such as a door or a window, should contribute something pleasing to the whole.

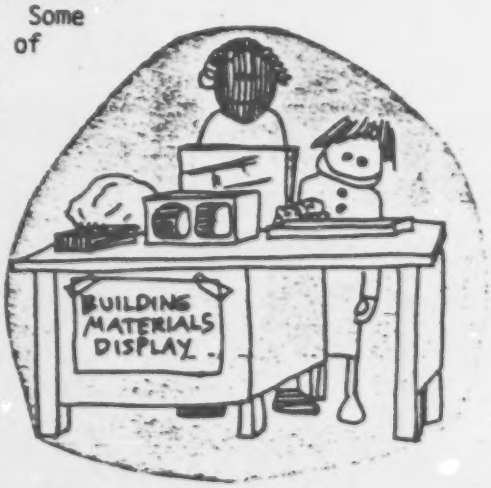
2

Because of its special rhythm and harmony, many people call architecture "frozen music." What exactly does this mean? "Frozen" doesn't always mean something is icy. It can also mean "not moving." When someone shouts "Freeze!", it means you have to stand very still. So buildings are "frozen" in the sense that they don't move.

When you look at a building--don't examine it just with your eyes. Feel it with your hand. Does your hand slide easily and smoothly, or does it stop and start on the roughness of a bumpy surface? Hold a piece of thin paper against the side of a building. Then gently rub over the paper with a soft lead pencil or a dark wax crayon. The lead or crayon will pick up the texture and you will have a rubbing of the building's materials. Make rubbings from several buildings--perhaps one with glass sides, and others made from stone or wood. Label each rubbing. See how many kinds of texture rubbings you can collect.



Go on a scavenger hunt to find pieces of building materials. Remember never to break anything off a building! Just try to find pieces of materials that have been discarded in open lots, in courtyards or along the streets. Some materials will be easy to find, such as pieces of rough wood or smooth stones. If you're lucky, you might be able to pick up some old bricks, and perhaps a small chunk of cement. Take the materials you find to your class. Then you and your friends can decide which of them seem "hard" or "soft."



3

ROWHOUSES

Rowhouses have been popular city homes for a long time. Many rowhouses in the United States were built in the 1800's. They are usually two to five stories high, with iron gates in front and a little garden in the back.

Rowhouses were built of wood, brick, limestone and brownstone. In New York City there are so many brownstone houses that the name has stuck. Many people call all city rowhouses "brownstones" even if they are built from other materials.

Rowhouses are a perfect example of "frozen music." Stand across the street from a long line of these houses. The curves and repeated designs of the windows and doors give a rhythm and a feeling of continuing on and on... almost like a tune that goes round and round in your head.

Through the years of use, many old rowhouses have become shabby. To fix them up, people have sometimes replaced the original doors, and perhaps added new windows. Many fine examples of rowhouse architecture have been spoiled by people who have tried to make them into something they thought was more modern. But, just as often, old rowhouses have been saved in their original form. They add a great deal of charm and beauty to city streets.

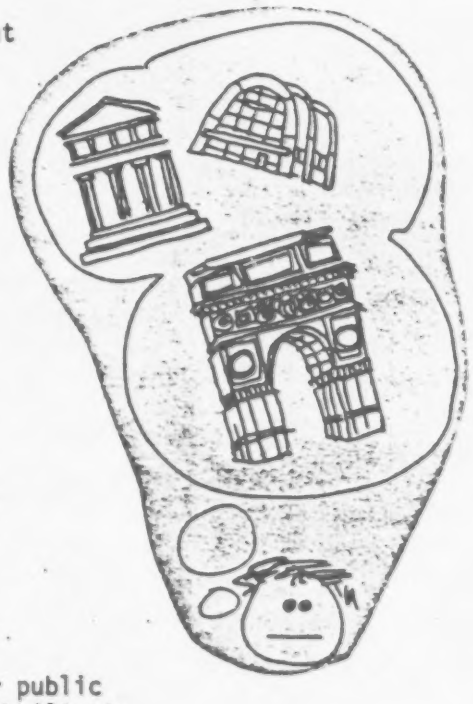
Because rowhouses are so close to the street, you can get to know something about the people inside without ever meeting them. Do they like flowers? Is there a smiling jack-o-lantern in the window at Hallowe'en or a lighted tree at Christmas? You might hear children laughing or a baby crying in its room. Pots and pans may clank in the kitchen and you might even smell food cooking for dinner.

Rowhouses are a very personal kind of architecture. Many people say they feel comfortable when they look at them. They don't feel overpowered. They can see themselves fitting right in--without any trouble at all!

4

SOLID AND STRONG PUBLIC BUILDINGS

The architectural museum of the city environment is made up of many buildings that are not used for housing. They may be office buildings, schools, places of worship, or factories. Most of these older public buildings are solidly constructed of stone, brick or wood.



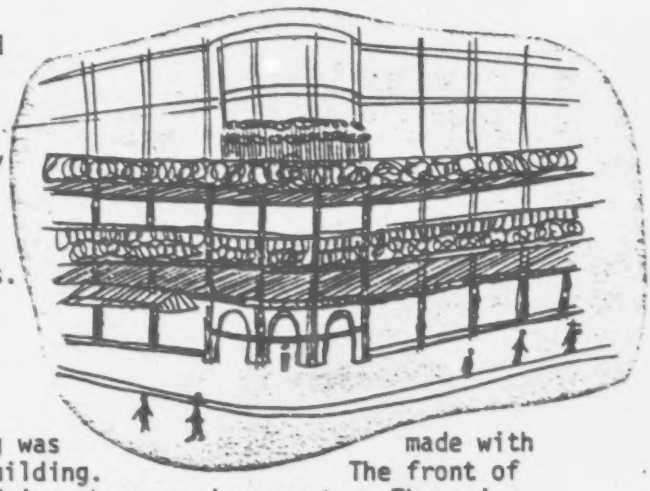
Solid old public buildings offer a good chance to observe both "hard" and "soft" materials. For example, one might be made of soft-looking bricks with arches of hard, rough stone around each window. The building may also have curved as well as straight lines. It may look both heavy and delicate. There are often huge open areas within the building that give it a look of strength and a feeling of power.

Many older public buildings were built at a time when life was slower and lots of workmen were available. Skilled bricklayers and stone masons spent hours laying their building materials in complicated patterns and designs. They took pride in their work. Around the entrances and windows are carvings and details (ornaments) that are almost never seen on modern buildings. Ornaments such as carved animal heads don't cover up the building, but are there to make it more beautiful and interesting to look at. They help to create a look of great strength and solidity.

Go for a walk and take a sketch pad with you. Find some old public buildings that have lots of ornaments on them. Try to copy the carvings around the doors and windows. Are the stones or bricks laid in patterns on part of the building? Can you find any carved animals? Note as much about the building as you can. Try to imagine what it was like when the skilled workmen were constructing it.

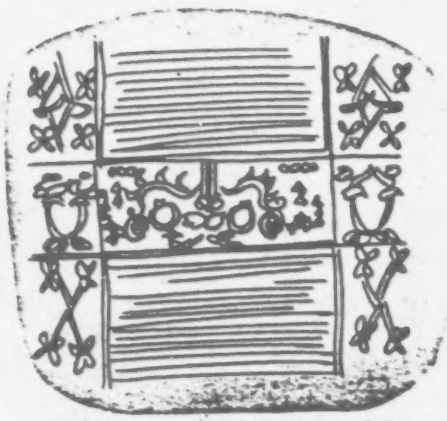
5

CAST IRON FRONTS

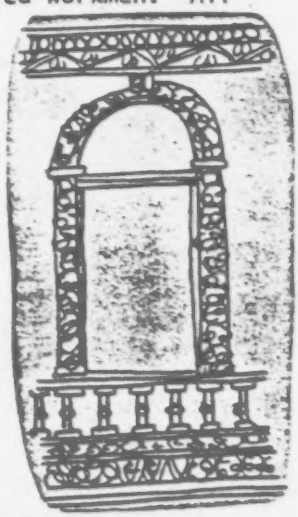


As time went by, solid and ornamented buildings became more and more expensive to make. In addition, many builders wanted larger windows to let in more light. Both of these problems were neatly solved by putting cast iron fronts on public buildings. The cast iron fronts were much cheaper to make because many of them could be made quickly in factories. And, because iron could provide stronger support, the window spaces could be made much larger.

In cast iron architecture, a building was made with three strong brick sides to hold up the building. The front of the unfinished building was a framework of iron beams and supports. Then pieces of cast iron were bolted onto the framework. Many department stores and small factories were built in this way.



The pieces of cast iron were made into the forms of columns and designs that were similar to those made in stone by the skilled workmen. All of the pieces fit onto the frame in such a way that they formed the entire front of the building--like piecing together a huge puzzle.

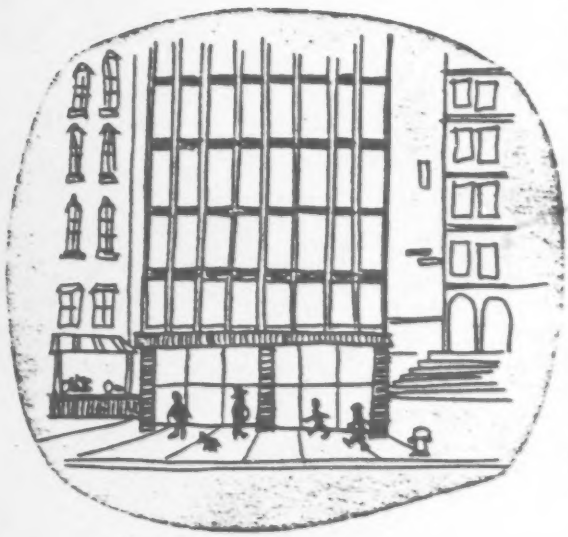


To make the cast iron pieces, iron was heated until it became a liquid and was poured into molds. As the iron cooled, it became very hard again. Only now it was "cast" into the shape of columns and ornaments. When the pieces of cast iron were taken out of the molds, they were ready to be put on the front of the buildings.

To see how molds work, make a gelatin mold for your family's dessert. First pour the heated liquid gelatin into a mold. Then put it into the refrigerator to cool. As the gelatin cools, it will become firm and will set into the form of the mold. Turn out the gelatin and the molded piece is ready to eat!

6

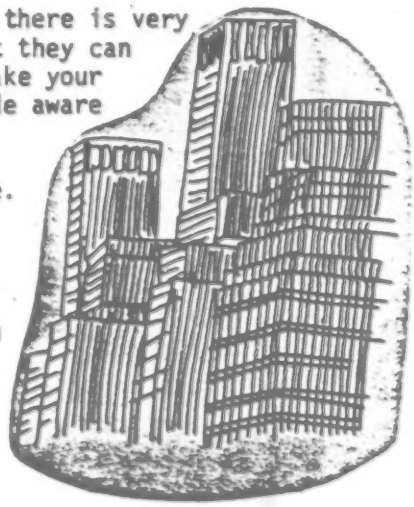
SLEEK GLASS BOXES



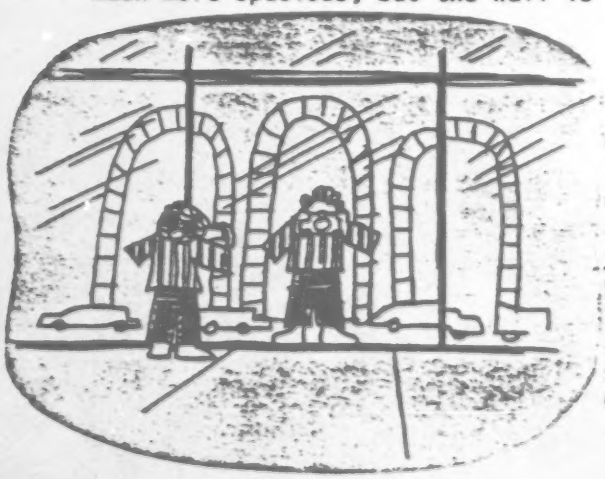
In the past few years, tall glass office and apartment buildings have become a very familiar part of our city architectural environment. One reason for this is that glass itself is now cheaper than it used to be. And aluminum can now be made into strong strips that are used to join large sections of glass together.

But how can glass sides hold up a tall building's enormous weight? It's very simple--they don't. The glass is really just a "skin" that gives no support to the building at all. Beneath the glass "skin" is a mighty "skeleton" made up of very strong steel and concrete. The glass is there only for appearances.

Unlike the old stone, brick or cast iron buildings, there is very little ornamentation or detail on the "glass boxes." Yet they can create a forceful effect. The bare, sleek glass sides make your eyes swoop right to the top of the building. You are made aware of the building's height, strength and power. You might even feel a surge of energy when you look up at it--the same way you do when you see a rocket take off into space.



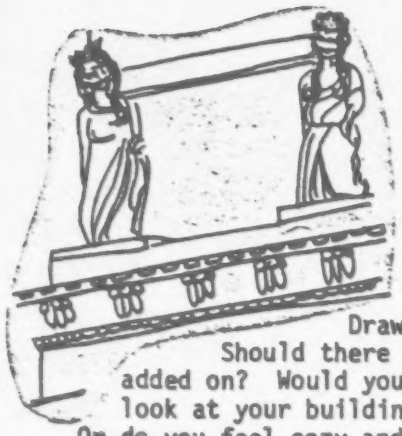
The sky and the moving clouds are reflected in the glass sides, giving the impression of open space, even in the midst of many tall buildings. It's like covering one wall of a small room with a mirror. The room looks much more spacious, but the wall is still there.



Most photographers love to take pictures of glass buildings because the glass reflects light and mirrors the surroundings. Photographs of these buildings are often seen in exhibits, advertisements or photography books. Why don't you give it a try? Perhaps you can take pictures of the same glass building at different times of the day. How does the building's appearance change as the sun moves across the sky and the light shifts from one side to the other?

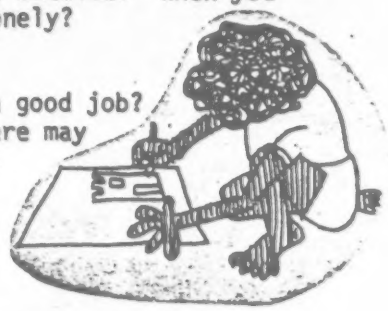
7

BECOME YOUR OWN ARCHITECT



Now that you've looked at some of the exhibits in your city's architectural museum, examine the building that you live in. Is its structure heavy or delicate? Are the materials "hard" or "soft?" Does it have curved or straight lines? Is your building a rowhouse, a solid and ornamented apartment building, or a new shiny glass skyscraper?

Draw pictures of your building. Study its form and design. Should there be more or fewer windows? Would you like another room added on? Would you like less or more decoration on the outside? When you look at your building, does it make you feel lost and lonely? Or do you feel cozy and contented?



Do you think that the architect of your building did a good job? If not, how could you make it better? Think about it! There may be many ways to improve your own architectural environment.

HOW TO ORDER ECO-NEWS

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TEACHER'S GUIDE, VOL. 8, NO. 1 SEPTEMBER/OCTOBER 1977

Written by: Nancy Wolf, Editor of Eco-News and Education Specialist - Environmental Action Coalition, Inc.

Children who grow up in an urban/suburban area are fortunate in having a rich and varied visual environment. In addition to their contact with the natural world through flowers and plants growing in window boxes, street trees, courtyard/backyard plantings and formal city parks, they are surrounded by diverse and often exciting examples of buildings reflecting many architectural styles and periods. The "built environment" thus becomes an important influence on young people's lives in towns and cities. Oftentimes it affects them more strongly and subtly than the natural environment.

A great deal of time, attention and scholarship has recently been devoted to the study of how children interact with their city "built environment." This Eco-News issue seeks to add to that body of work by pointing out some architectural delights that may be readily available to urban children and by stimulating them to experience their habitat in deeper, more meaningful ways.

An interesting way of extending the impact of "The Museum You Live In" is to take your students into the "Museum" by conducting an observation walk through the school neighborhood and through as many other areas as possible. It's

important to prepare your students for these walks by reading and discussing the Eco-News issue with them thoroughly. As they walk, students should be encouraged to look for and identify the different kinds of buildings seen in Eco-News and to assess and analyze the buildings' impact on the surrounding area. Emotional and aesthetic considerations should also be brought out, to highlight the way children feel when on certain blocks or near particular buildings. They may have felt some of these emotions privately before, but now they should be helped to carefully observe, to notice and express, and thus to become more fully aware of the ways in which the "built environment" directly affects them in their daily lives.

To aid you to promote and enhance this systematic observation, we have devised activities for this issue that will encourage students to become actively involved with their "built environment" by touching and feeling, by collection and classification. An extension of the building material collection and exhibition could be a student project utilizing the construction of a model house (or a model street), illustrating the diverse types of structures in their school or home neighborhoods. Model materials to be used could be fiberboard or heavy cardboard, light strips of wood or small brick sections, chunks of stone or cement. The average student, of course, is interested in building a structure very much like his/her own dwelling, but each student should be encouraged to study and build models of public buildings, stores, factories and other architectural structures.

Some students may be interested in putting together an "ideal neighborhood," a project which would include some decision-making processes directly relating to good planning. A previous Eco-News issue, Vol. 6, No. 6, City Planning (published March/April 1976, available for $1.25 with Teacher Guide) would be of great help in such a project.

A special math project, flowing out of the model-building activity, could be taking some measurements of an actual small neighborhood building. Calculating the width of a house and the dimensions of its doors and first-floor windows, interested students can begin to develop skills employing a sense of scale and design, as well as a realization of the many complex and important decisions each architect and/or builder must make. Thus, they will begin to see that there are some buildings that are put together more carefully and thoughtfully than others, usually with superior results.

Not only can young students walk through the city's architectural museum, they can explore its history. By dividing students into groups, it will be possible to attempt historical studies of rowhouses, of cast-iron buildings, of interesting old places of worship, of skyscrapers, and of many other examples. There are books that highlight the history and evolution of architectural styles in both words and pictures to enhance the students' enjoyment and appreciation of their architectural surroundings.

There are numerous possibilities for teaching art in connection with this issue's subject matter. Students can paint or draw individual houses or groups of buildings; they could also prepare photographic exhibits. Eventually they could prepare a "cityscape" mural to enliven and decorate the schoolroom.

Where practicable, you may want to encourage your students to practice some construction techniques used in building city structures. They would enjoy building a wooden window frame, a small brick wall, mixing cement and concrete, pouring it into forms for creating various building constructs. If your school has a metal-working shop, the students might be able to develop model building components such as columns and beams or modular panels. The results of these construction projects could be presented either as a special class exhibit or to the school as a whole.

Difficult to accomplish, but potentially very fascinating, is a lesson aimed at encouraging students to explore their feelings vis-a-vis the city "built environment." There could be class discussion, with lively debates on one style of architecture versus another. Some children may want to write their thoughts and feelings down, either as prose or poetry. Some may want to develop a sketch or playlet to illustrate the way people respond in different ways to different surroundings.

City living is rich, complex and challenging to the student's imagination. Most of the buildings that comprise a neighborhood have an interesting history -- all are part of the urban/suburban habitat in which most of us live. By students studying how their neighborhoods came to be, they also will be exploring the historical, economic and sociological forces that helped shape the buildings in their environment and their present impact on the area's ecology.

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Type 3 Activities:

Redesigning and Restructuring

1) Draw a floor plan of one floor of your school. Put in bathrooms, closets, stairs, etc. Evaluate whether space is used most effectively. If not, redesign the floor.
2) Design your ideal apartment, house, or block. Include in the plan, the arrangement of furniture(apartment, house) or buildings(block).
3) Compare/contrast our building structures with those of other places in other climates. How does the way buildings are constructed relate to the climate in which they are located?
4) Write to the City Planning Commission for information on new construction sites you can visit. Ask a member to come in to talk to you about city planning
5) Write to The Elementary Teacher's Workshop, Route 59A, West Nyack, New York 10994, for copies of "The City" which appeared in the January 1973 issue.
6) Compare/contrast the roles of the architect, the planner, the engineer, and the interior designer. How are they alike? How are they different? Choose a project to do and ask the specialists listed above to help with their particular job.

TOPIC: TRACING YOUR OWN ROOTS/GENEALOGY

ROOTS AND BRANCHES

HISTORICAL PERSPECTIVE

Each new generation has to face new problems as the result of constant change. The rate of change is accelerating rapidly. This necessitates new problem-solving skills--as well as a firm sense of values about where we want to go.

Developed by Susan Sager

LEVEL 3 - 6 TIME 4 30-min. periods

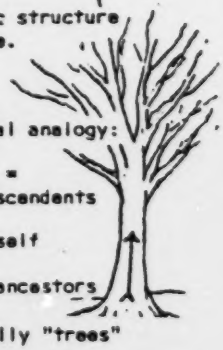
ENTRY CONCEPTS:

--ability to deal with concepts involving generations, ancestry, and descent
--ability to draw reasonable conclusions when analyzing data

MATERIALS:

Charts illustrating family trees that
(1) "grow" down
(2) "grow" sideways
Duplicated branching diagrams for students.
History resource materials;
Writing paper and pencils

HUMANITIES / AFFECTIVE:

TEACHER TASKS:	STUDENT: ENABLING BEHAVIORS: The student:	In order to:	LEARNINGS:
INTRODUCTION: (Ask the students whether they know what a "family tree" is. Discuss the ideas that are contributed. Ask whether the students know the purpose or possible benefits of tracing one's ancestors. During the course of the lesson, clarify any unfamiliar terms.)	listens, responds, discusses	gain awareness that	a "family tree" is a diagram of an individual's ancestry, relatives in the same generation and/or descendents.
LESSON DEVELOPMENT: 1. If you feel as the author of this lesson does, say: "Something has always bothered me a little bit about calling a diagram of ancestry a tree.	listens	become aware of	certain incongruities involved in calling a diagram of ancestry a "family tree."
Trees grow up out of the soil, with their branches reaching skyward. Their roots reach down into the soil, seeking water and nutrients.	listens and visualizes	review	the basic structure of a tree.
If we see our self as the trunk of the tree...then the roots represent our ancestors and the branches represent our descendents." (Discuss.)	listens and discusses	identify with	a personal analogy: branches = descendents trunk = self roots = ancestors
			
"But a 'family tree' isn't shown like this. It seems to grow in the opposite direction--'down' instead of 'up.'" (Show illustrative chart.)	observes a chart	notice that	some family "trees" grow down instead of up.
"And often it even grows sideways!" (Show illustrative chart.)	observes a chart	notice that	some family "trees" grow sideways.

(REPRINTED FROM GIFTED/TALENTED EDUCATION)

"Be that as it may, let's talk about our ancestors. How many parents does every human being have? I mean <u>biological</u> parents, whether present or distant, living or dead. How many grandparents? Great-grandparents? Great-great-grandparents? What happens to these numbers as we go back each <u>generation</u>?" (Discuss.)	listens, responds discusses (2) (4) (8) (16) (They double.)	determine that	we are going to talk about our own ancestors; and how many we have in each generation.
2. (Distribute duplicated branching diagrams with a single line on the right for the student's name and birthdate, and two, four, and eight lines fanning out to the left for the names and birthdates of parents, grandparents and great grandparents.	accepts and studies a branching diagram	become familiar with	one kind of "family tree" branching diagram.
Have the students fill in as much of their diagrams as they can. Diagrams may be completed at home, using family members as sources of information.	fills in the lines of the diagram	gain information about	the names and birthdates of his/her own ancestors.
As an alternative, a student may make a family tree diagram for a famous person such as Queen Elizabeth II of England.)	completes another family tree	gather information about	the ancestry of a famous person.
3. (Have students analyze and compare what was going on--during the time segments delineated by the births of the four generations--in technological development, historical events, popular culture, etc.). The general form of the questions: "In the year you (your parent, etc.) were (was) born, what important technological advance (historical event, etc.) had just taken place? What was the population of the United States that year?" etc.	investigates and researches generational time spans answers questions	develop demonstrate that he/she has acquired	the ability to analyze and compare historical conditions during different generations. a sufficient body of data from which to draw valid conclusions.
(Through research and further comparison and analysis, lead the students to develop a sense of historical sequence and continuity. They should also be led to discover such significant trends as <u>accelerating</u> technological development and <u>geometrically</u> increasing population.)	probes further analyzes data	develop discover	a sense of historical sequence and continuity. significant trends such as accelerating technological development and geometrically increasing population.

A beginner's kit, for $6, from Robert Tarte, President of the Massachusetts Genealogical Society, FRANK GENEOLOGICAL FORMS, P.O. Box 215, Ashland, MA 01721.

4. (As students become familiar with the history of their own and their immediate ancestors' generations, have each student write a story about a hypothetical typical day in the life of a parent, grandparent, or great grandparent when he/she was the same age as the student is now.

Using resource materials as well as personal interviews, students should include as much historical information as can be integrated into their stories. But there should be small, personal details of the kind that seldom get into history books.

The stories may be displayed on the classroom wall in different rows for each generation.)

synthesizes historical information and imagination	compose	a story about a hypothetical typical day in the life of an ancestor at the students' same age.
uses resource materials and personal interviews	integrate	historical information and small personal details.
reads stories written by class	appreciate that	the way of life of each generation differs from that of preceding and following generations.

EVALUATION:

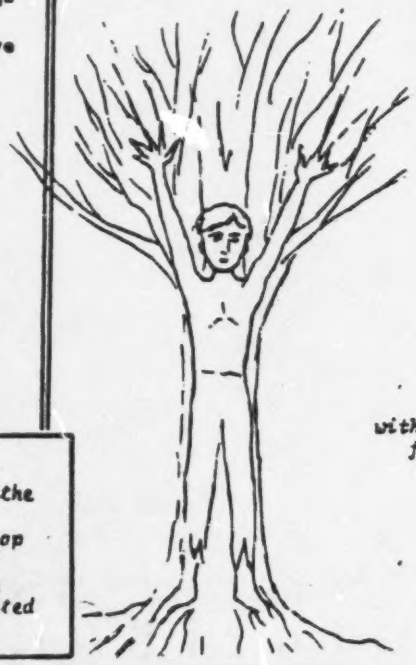
5. (During a class meeting, discuss the developments that have taken place in transportation just during the lifetime of one student's grandmother or great grandmother.)

listens, discusses, interacts	conceptualize	the rapid developments that have taken place in transportation during the lifetime of a still-living relative.

Questions to consider:

What are the implications of such rapid change?
What effect has it had on our life style?
Has it had this effect uniformly throughout the world?
Have all the changes been gains...or have there been losses as well?
What effect has rapid change had on our values and beliefs?
Why has the rate of technological development accelerated faster and faster in recent years?
Why does the population continue to increase?
What are the "best" ways to deal with such conditions?
What kind of world do we want to live in? Why?
How might we best achieve such a world?

listens, discusses, interacts	consider	implications of such rapid change; problems that might result from such rapid change; possible ways of dealing with these complex problems; the kind of world that is desirable; the best ways to achieve such a world.



Given the opportunity to work with family trees and do research about the time segments delineated by family generations, the student will develop a sense of historical sequence and continuity and an awareness of some of the conditions and problems created by accelerating change.

with permission.....
from UNICORNUCOPIA: A Guidebook for the Gifted and Talented, Kyrene School District, Tempe, Arizona

New York Post 9/28/77

FINDING YOUR OWN ROOTS

Two new books explain step by step how to fill in the blanks in your past

By ROBERT FRIEDMAN

When you read Alex Haley's "Roots" or watched it on TV, did you too wish you could journey into the past, to learn the names and histories of the men and women whose lives and characteristics led to and shaped your own?

Well, if Alex Haley did it, so can you. And what's more, a flurry of new how-to books has taken the expert's mystique out of family tree-tracing. Step by step they show how you, how any one of us, without any prior skill or training, can track down even the most elusive ancestor.

Janice T. Dixon and Dora D. Flack put it this way in their new book, "Preserving Your Past," which Doubleday will publish on Oct. 7:

"A family history is a story of a family's heritage. It is not simply a collection of names, dates and facts, but the story of a person's ancestors written in such a way as to re-create a glimpse of humanness from the past . . .

"Our children need to know our parents and grandparents and beyond, as we know them, not as names and places and unsmiling photographs, but as warm, real, people."

But how do you begin? Not straggely, you begin by selling down what you already know about yourself and your family. Another practical new guide, "How to Climb Your Family Tree: Genealogy for Beginners," by Harriet Stryker-Rodda, to be published by Lippincott on Oct. 14th, explains:

"The very first step, then is to write down what you know about yourself.

"Begin with where and when you were born. What was your father's name? Your mother's? What was her maiden name? Were you baptized, christened, or bar mitzvahed? Where? When? Were you married? More than once? Divorced? What is (are) the full name(s) of your spouse(s) . . ."

With those facts as a foundation, both books demonstrate, you can go on to build, step, by step, the house of your ancestors. You start by talking with close family members, then, more distant relations, old family friends, neighbors. Every stray fact may be valuable, every bit and piece may fit into the great mosaic of the past.

Sometimes memories are faulty, exaggerations turn fact into fantasy, but as you carefully check one story against another, and both against the records, only the verified truth remains.

Where do you seek out those records? Both books are reliable and explicit guides. Birth, death, marriage and divorce records are usually available from state health departments or their bureaus of vital statistics. Real estate deeds, school records, military rolls (these, "Preserving Your Past" explains, can be tracked down from county clerks for early militia rolls, from the National Archives in Washington, for others), church and synagogue histories, even the names and dates on tombstones.

Much of the work may even have been done for you. There are genealogical societies and libraries and publications, which have compiled vast amounts of information about Americans past. From one of these or a particular ethnically or nationally oriented, or regional historical society, you may find the facts you might otherwise have to hunt for.

"Preserving the Past" suggests: "Separate genealogical libraries and historical societies are all over the world. Some require membership to use their records, and it would be advantageous to join one such as the extensive New England Historical Genealogical Society, 101 Newbury St., Boston, Mass. 02116. You would have time and money which would otherwise be spent in correspondence and travel."

Pitfalls abound. We are a nation of immigrants and the pressures, economic and cultural, to homogenize us all were great. So when a surname was a tongue-twister to pronounce, was not Anglo-Saxon enough, it was apt to be changed.

But don't despair. There are clues and with skill and perseverence, if the records of the change are lacking, one may still prevail. "How to Climb Your Family Tree" is rich in examples of the kind of metamorphosis a surname was likely to experience: ". . . Lubentstein became Livingston; Goldstein became Goldstone; Petrova became Stone; Casablanca became Whitehouse.

Conceded, you may have to go through a lot of "time-wasting search" unless some individual or branch of the family has reverted to or retained the original name.

Some people who'd like very much to know their family histories nevertheless believe the task is insuperable. Jewish-Americans, mindful of the fact their surnames may have been changed, or altered by Anglicized spelling or that surnames in any case are only a relatively recent Jewish tradition, may feel particularly daunted.

But "How to Climb Your Family Tree" deprecates this feeling and offers heartening encouragement.

Both books offer useful bibliographies and "Preserving the Past" also includes a particularly valuable state-by-state list of where to write for specific birth, death, marriage and other records.

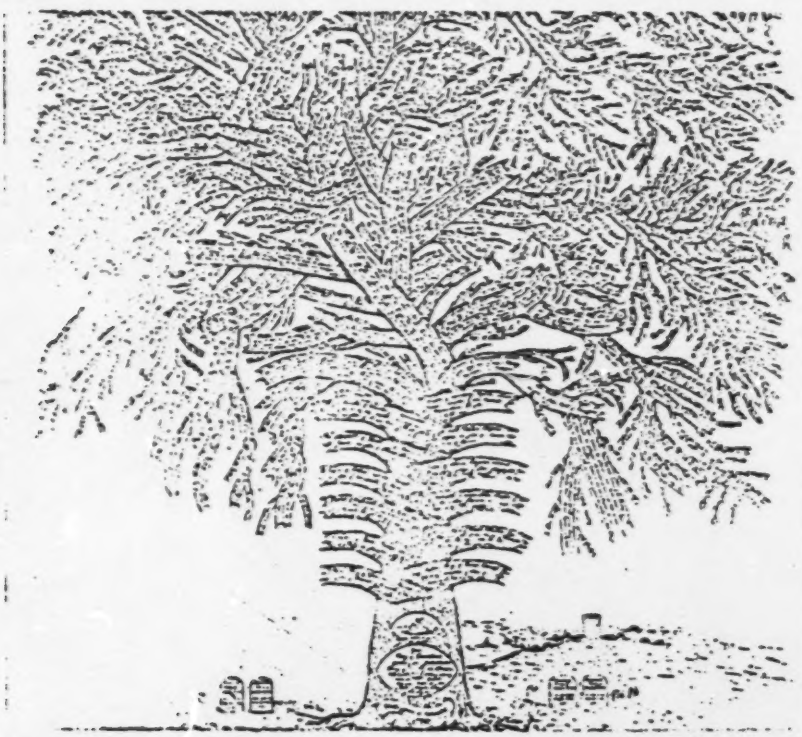
Why this renewed American interest in individual heritage? "Roots" may have contributed, but the reasons lie deeper than that. It was perhaps inevitable that the popularity of self-search, self-study psychology in recent years would lead us not only to self-understanding, but to search out the forebears who helped make us what we are. And disillusion with government and society are stimulating a revitalization of family — that venerable institution which the pundits have repeatedly assured us is dead, or dying.

A final thought. You too are an ancestor. To your children and your children's children, you are a link to the eternal past. The authors of "Preserving the Past" not only urge you to set down the story of your own life for those who follow you, they offer practical step-by-step assistance.

After all, who better than you can tell your history?

Happy searching.

Names change . . . but don't despair



Rooting Gallery

"It's easy to find stuff if you know what you're looking for," says Karen Stinehelfer, who runs the Genealogists Bookshelf. She won't trace your history for you (unless you've got lots of time and money), but helps you do it yourself by kind advice, research aids in specialized areas (such as *Sources for Genealogical Searching in Kentucky, Irish Family Research Made Simple, Your Ancient Canadian Family Ties, Directory of Census Information Sources, Where to Write for Marriage Records*), books on heraldry, family trees, etc. Her own story: "I got into this at thirteen through my maternal grandmother, who had a strong sense of history. Summers, we'd go out to the cemetery with a picnic and then walk among the relatives' gravestones. I felt as if I knew them all." Already Karen has traced her mother's family back to the 1400s in Northern Italy, and her father's to the 1600s in Germany. "Anyone with a detective spirit likes the chase," she says.

GENEALOGISTS BOOKSHELF / *330 East 85th Street* / 879-1699

92 from Best Bets by Ellen Stern

TOPIC: LOOKING AT THE FUTURE

LOOKING AT THE FUTURE

From "Creating Alternative Visions" in Gifted/Talented Education, November, 1977, shared by Ms. Kathleen Schoonmaker, Norwalk, Va., With additions.

1) Write four headlines for the year you reach 35 years of age. Write news articles for one of these headlines.

2) Design a class newspaper for a class of students your age in an IGC or SPE class in the year 2000.

3) Illustrate and describe the device which will take you to work at age 45.

4) Write a short science fiction story about life on a space station, a lunar installation, or an inter-planetary space ship.

5) Describe at least 6 potential uses of the computer. List the advantages and disadvantages for at least two of these uses.

6) Pick at least one invention which will be commonly owned by the year 2000 and explain how it will make life different then (e.g., the telephone with a picture screen).

7) Make up a universal language that it simple enough to teach all human beings and that can be sent through space.

8) Create a labor-saving device. List its advantages and disadvantages and explain its uses.

9) Design a rapid transit system to be used in your area in the year 2000.

10) Design the school and classroom of the future.

11) Examine present architectural designs in housing and building structures. Conduct an interview with an architect concerning new building materials, present restrictions which prevent their use now. Design a model home or building for the year using these new materials and an innovative design.

12) Create and display posters dealing with various futuristic themes.

13) Research one or more inventors and their inventions. Discuss and/or illustrate the impact this invention has had on our society and the world.

14) Design a model, draw and/or write a description of a city that is underwater, underground, domed, in space, or in a skyscraper. Show where people work, live, shop and how they move from place to place.

15) Collect articles from the newspapers and magazines that foretell of future discoveries and inventions: foods, medicines and cures, electronics, education, transportation, housing. Explain how each will effect your life.

16) Write a journal about where you will be and what you will be doing in 1986, 1996, 2006, 2006, 2016, 2026.

17) Write or interview a State legislator and or Congress person about present State and Federal land use regulations. Create a local hypothetical land-use map providing land for recreation, industry, public and private services, transportation.

18) Conduct student, parent, and/or community surveys on such topics as:

What are your expectations for the future?
Should we limit the use of natural resources?
Should we limit population growth?
What do you expect to be doing in 50 years?
What will our city be like in 50 years?

19) Write a scenario or play about the effects of computers and robots/humanoids on the home and family.

20) Design a human being of the future. Body parts should reflect your projections for artificial, genetic, and environmental changes. For example, if intelligence increases, the head might be larger than the present size; or if air pollution continues and we can breathe the air naturally, what changes will that make in terms of exterior equipment added to the body.

21) Compare all the TV shows which deal with the future in some way: Star Trek, the $6Million Man, the $6Million Woman, etc. How are they alike/different? What aspects of these shows may actually exist in 10, 20, 30, 40, 50 years or more?

22) Write, tape record, and/or photograph a 60-120-second commercial promoting the study of the future or a futures topic.

23) Write and dramatize a play dealing with a futuristic situation.

24) Interview people of different ages, sexes, and backgrounds about their ideas on how men's and women's roles will be different in the future. Graph your results.

25) Design a museum of the future which would be an addition to the community's present historical museum.

Type 3 Activities:

1) Write to the World Future Society, P.O. Box 30369, Bethesda Branch, Washington, D.C. for information. For $3.95, you can obtain a copy of "Films on the Future: A Selective Listing;" for $5, you may buy Teaching Futures: A Collection of Articles, Syllabi, Bibliographies, and Teaching Ideas in Future Studies. To subscribe to The Futurist, send $12 for one year.

2) Write to the University of Massachusetss, Amherst, Massachusetts 01002 for a sample copy of "The Future's Information Interchange Newsletter."

3) Read Alvin Toffler's Future Shock.

4) Write to Scholastic Magazines, New York City, for a copy of "The Future: Can We Shape It?"

5) Write to Ray Bradbury, noted science fiction author..

TOPIC: METRIC MEASURING

METRIC MEASURING

1. Find your height.
   standard measure_____
   metric measure_____

   Sex(Mor F)_____

2. Find your weight.
   standard measure_____
   metric measure_____

   sex_____

3. Measure your arm span(arms extended).
   standard measure_____
   metric measure_____

   Compare it with your height.
   standard_____
   metric_____
   Are you a square, a tall rectangle, a wide rectangle?
   _____

   Sex_____

4. Pulse rate, sitting_____
   Pulse rate, after walking at normal pace for 1 min._____
   Pulse rate, after running in place for 1 min._____
   Pulse rate, after resting for one full minute after doing the above_____

   Sex_____

5. Find the length of your foot in centimeters.
   Right foot_____
   Left foot_____
   What is your shoe size?_____
   What is the ratio between foot length and shoe size?
   _____

   Sex_____

6. Find the surface area of your hand in centimeters._____

   Find the surface area of your foot in centimeters._____

   What is the relationship between the two?(If you pick your right hand, pick you right foot also.)
   _____

   Sex_____

7. Estimate the length of a minute(with eyes closed).
   How accurate were you?
   How many seconds off were you?_____

   Sex_____

8. What is your birthdate(month and day)?_____

   Are there any birthday twins?

   Sex_____

9. What is your age in hours?
   Estimate&&_____
   Actual_____

   Sex_____

10. Estimate the length and height of this room.
    Height_____ Length_____

    Sex_____

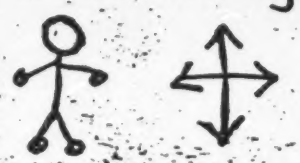
NOW CUT UP YOUR PAPER AND PUT IT IN THE APPROPRIATE PILE AT THE FRONT OF THE ROOM. EACH GROUP SHOULD CHART THE RESULTS OF TWO QUESTIONS IN AT LEAST TWO WAYS AND PRESENT THEIR RESULTS TO THE CLASS.

TOPIC: NEWSPAPER MATH

Metric Measuring for Younger Children

① How tall are you?
In inches? _____
In feet? _____

② Are you a square or a rectangle?



③ What size shoe do you wear? _____
Is your foot that long in inches? _____

④ How long is your pace (step)?
inches _____

⑤ How fast do you walk? _____
(How many steps do you take in a minute?)

⑥ How long is your hand span? _____

⑦ What is the area of your body surface?
in square inches
_____

⑧ What is your birthdate?
_____

⑨ How many days old are you?
_____

⑩ How many times do you breathe in 1 minute?
_____

⑪ How many times do you breathe in a minute after running in place for a minute?
_____

⑫ Estimate how long a minute is. Close your eyes and count. Did you count the same number of seconds as it really was? How many did you count? _____

Metric Measuring License

This license entitles _____, upon completion of the form below, to be an OFFICIAL METRIC MEASURER, authorized to measure, at any time, using any OFFICIAL METRIC UNITS (such as cm, dm, m, km, g, or kg), ANYTHING that can be measured either with OFFICIAL MEASURING TOOLS or by ESTIMATION.

height _____ cm *arm spread _____ cm* *nose to fingertip _____ cm* *elbow to fingertip _____ cm* *handspan _____ cm*

palm _____ cm *thumb _____ cm* *index finger _____ cm* *middle finger _____ cm* *ring finger _____ cm* *pinkie _____ cm*

knee to floor _____ cm *foot length _____ cm* *foot width _____ cm* *shoe length _____ cm* *shoe width _____ cm*

plain step _____ cm *giant step _____ cm* *most gigantic step _____ cm* *circumference of head _____ cm*

circumference of neck _____ cm *circumference of chest _____ cm* *circumference of wrist _____ cm* *circumference of waist _____ cm*

circumference of thigh _____ cm *circumference of ankle _____ cm* *weight _____ kg* *weight of shoe _____ g*

weight of relaxed hand _____

age _____ years _____ _____

signature *date*

ALL OF THESE MEASUREMENTS WILL CHANGE–KEEP YOUR METRIC MEASURING LICENSE UP TO DATE

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NEWSPAPER MATH

The newspaper is an excellent resource for math activities. The activities can easily be stated so they reinforce the analysis, synthesis, and evaluation skills.

1) Compare advertising and news space on a typical page in three newspapers. Graph your results.
2) Compare the sports, editorial, and front pages of three newspapers in terms of readability(level of difficulty - average size of words and average number of words per line). Graph your results.
3) Compare several products of your own choice according to cost in three different newspapers.
4) Skim through the pages of three different newspapers. Cut out the advertisements which catch your eye. Analyze why (size, appearance, copy, color, other). Ask other class members to do the same. Analyze the ads they chose. Compare.
5) You have been given $50 by the PTA of your school for your classroom Using the newspaper, pick what you would buy.(rug for floor, book shelf, books, etc.).
6) Compare three newspapers according to type size, headline size, number of words per line, columns per page, etc.. Graph your results.
7) Study sales in the newspaper for six months. Are sales seasonal? If so, what is on sale in each season? Present your results to the class.

TOPIC: CREATIVITY AND OLD-TIME RADIO/
SOUND EFFECTS

GIFTED/TALENTED EDUCATION

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GIFTED/TALENTED Education, Inc.
Edited by Rudolph Pohl, Ed. D.

PARENTS AND EDUCATORS ARE PARTNERS IN THE EDUCATION OF GIFTED/TALENTED CHILDREN

This was the catchy title for a special institute co-sponsored by the Council for Exceptional Children, The Gifted Child Society of New Jersey, and the U. S. Office of Education, on October 9, 1976. Some of the highlights from this institute include a new emphasis on an aspect of identification of gifted/talented by the keynote speaker, Joseph Renzulli; what a classroom teacher can do, by a teacher of the gifted; what to expect from school boards from a member of the New Jersey Board of Education; how business and industry can help a gifted program by a representative of an insurance company; trends in legislation by a C.E.C. staff member; and the selection of teachers of the gifted/talented by a professor from Hunter College.

Dr. Renzulli is concerned with the prevalent "got it" versus "ain't got it" thinking in terms of identifying gifted/talented children. He stressed, "We're guessing at giftedness in kids, that they will be productive as adults." High scores in childhood are not related to adult productivity. Eminent adults appear to have three abilities interacting together: above average, but not necessarily superior intellectual ability; task commitment or focussed motivation; and creativity. This suggests that we consider task commitment as crucial in selection for programs for gifted/talented children as we now consider intellectual ability and creativity. In the adult world, this driving absorption in their work was noted by Ann Roe in the 64 eminent scientists that she studied. Dr. Renzulli referred to a 12 year old who spent two years developing a board game.

He warned against spending too much time with "exercises" instead of providing the gifted with methodological tools with which to pursue real goals. The students six to eight years old at the Roeper City and Country Day School submitted a white paper document to 110 legislators. This paper on the ecological and economic benefits of the dragon fly, led to the

(Continued on Page 3)

CREATIVITY AND OLD — TIME RADIO

Thirty-eight years ago, a young radio broadcaster had an imaginative idea for a new twist in an old story. 22-year-old Orson Welles decided to do H. G. Wells' THE WAR OF THE WORLDS in news bulletin format. He recreated the Martian invasion of England as if it were happening in the farmlands of New Jersey with New York City being destroyed in the process. Many persons were so frightened by the broadcast (Europe was on the brink of World War II and we were just an ocean away), they didn't stay tuned for the disclaimer at the end:

"This is Oron Welles, ladies and gentlemen, out of character to assure you that THE WAR OF THE WORLDS *has no further significance than as the holiday offering it was intended to be—the Mercury Theatre's own radio version of dressing up in a sheet and jumping out of a bush and saying BOO! Starting now, we couldn't soap all your windows and steal all of your garden gates by tomorrow night—so we did the next best thing. We annihilated the world before your very ears and utterly destroyed the Columbia Broadcasting System. You will be relieved, I hope, to learn that we didn't mean it, and that both institutions are still open for business. So, good-by, everybody, and remember, please . . . if your doorbell rings and nobody's there, there was no Martian——it's Hallowe'en."*

GIFTED/TALENTED EDUCATION, NOV. 1976
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CREATIVITY AND OLD TIME RADIO

(Continued from Page 1)

Orson Welles almost ended his career with the reaction to his news-bulletin treatment of the science-fiction classic. Gifted students should find it interesting to listen to the original broadcast of *THE WAR OF THE WORLDS* by Orson Welles *(The October 30, 1938 broadcast is available on audio* tape #407 from A M Treasures and from other sources, see page 8). They then could listen to another tape (#193, A M Treasures) which was a rebroadcast of *THE WAR OF THE WORLDS* but with interruptions at intervals for interviews with persons affected by the 1938 radio program. The impact of this "Halloween prank" almost bought censorship over programs.

While the impact of television is visual; old-time radio depended upon sound effects to create an aura of realism in the mind of the listener. The key person was often not mentioned - - - the sound effects man. He had to have eye contact with the actors and actresses so that the sound effects would enhance the spoken words. It is awfully difficult to imagine a person being shot if there is no sound of a gun being discharged. On the other hand, if the actor is describing a stabbing and the audience hears a gun shot, credibility suffers. Sound effects men used their ingenuity to devise ways to create sounds artifically in the studio that gave the impression to the radio audience of the thing intended. As new ideas were developed, they were shared *with others.*

The task of becoming a sound effects man became easier with the advent of recording devices that could be used to store the sounds that were needed for a broadcast. Doing sounds live for a broadcast that was going over the airwaves left no margin for error. It required a great deal of creativity and hard work to get ready for a broadcast.

One young young fellow had *an* interesting start in his career as sound effects man. He had been working at Air Reduction in New York City but wanted to get into C.B.S. in the worst way. Page boys were paid $15 per week. He was broke and couldn't afford the Brookes Bros. suit needed to impress the interviewer.

One day he reported late for his regular job. When his boss had asked why he had arrived late, he replied "Cause you kept me late and I lost my sleep!" His insolence led to immediate dismissal and two weeks severence pay—enough to buy a Brookes Bros. suit. The interview was successful and he went to work at C.B.S.

The young man was frequently found hanging *around* the sound effects department. There was an opening for an apprentice and it paid $27.50 per week. Since he had been doing the sound effects for a local drama group over WFAS, White Plains, he decided to apply. They had him bring a script, provided all the equipment he needed, and auditioned him on the air. Hamilton O'Hara got the job. This gave him a year to prove himself as an apprentice and be moved up to full journeyman ($50 a week) — or out.

He had been an apprentice for a month when the sound effects man for *PEPPER YOUNG'S FAMILY* failed to show due to sickness. The director needed a replacement five minutes before air time. O'Hara was the only one available. If he were promoted, he couldn't be demoted. With NO REHEARSAL he put on his first show for C.B.S. The following week he was doing the sound effects for *SUSPENSE.*

Here are some of the sound effects described by Hamilton O'Hara as he recalls the early days of radio:

Impression On Audience	Sound Effect Used
Horses Hooves	Coconut shells, halved, were were strapped on the hands. These were tapped rhythmicly in a box containing assorted gravel & rocks. Crossing a bridge was achieved by tapping on a wooden board. An Alternative method was beating upon one's own abdominal wall.
Gun Shot	A 32 caliber pistol firing blanks or striking a leather chair cushion with a ruler (the expelled air sounds like gunshot)
Wind	A large paddle wheel rubbing along canvas.
Rain	BB shot rolled in a ½ bass drum (remember rain has no sound of its own, it has to hit something).
Thunder	A big 4 x 8 sheet of copper which is wriggled from the bottom corner. Shimmering gives the sound of rolling thunder; a whack gives the sharp sound of thunder.
A crowd of people	The actors and actresses who were not in the speaking part stood around the mike and made babbling sounds.
Troops marching	25 blocks of wood were mounted in a rope frame. These were tapped and scraped across a sandpaper surface to create the illusion of marching feet.
Walking through brush	Corn stalks squeezed and twisted in the hands of the sound effects man.
Walking in snow	Squeezing a box of dry corn starch.
Creaking Door	A block of wood with a slit into which is inserted a wooden dowel. A bolt is used to tighten the block to create differing sounds as a lever is used to turn the dowel in the block. The famous creaking door of the Inner Sanctum series was produced by a special door hinged like a washer-door opening outwards. A custodian once oiled the hinge as a "favor". Even cleaning couldn't get the squeak back—they had to leave the contraption on Fire Island for a week so that the salt air would rust the hinges to their original condition.

Impression On Audience	Sound Effect Used
Ripping up boards	A hollow sound box about 5 x 5 x 10 inches long with a swinging top. The under-surface of the top was criss-crossed creating a grating effect as it was drawn over the edges of the hollow box.
Gate swinging	Two boards with a spring hinge mounted between them. The sound effects man moved them at a speed to create the illusion.
Tinkle of ice in a glass	Flash cubes in a glass of water.
Pouring a drink	Pouring water into a glass or the use of a seltzer bottle.
Telephone	A special phone was mounted on a wooden box and connected to standard household buzzers. It could be used to create the sounds of dialing (clicks), a busy signal, or ringing the receiving party. The sounds effects man had to be careful to discontinue the effect as the actor began speaking). They would dial 5 numbers since 7 took too long—its the impression that counts.
Sounds of fighting	Sound effects man striking his own hand or body.
Falling down stairs, etc.	He fell down (sometimes ended broadcast, black & blue with bruises).
A caterpillar crawling on a branch covered with snow.	A challenge for your gifted students; have them try to create their own sound effects to accompany a radio script or have them write their own scripts.

You can get sound effects on a two record set for $4.99 from Publishers Central Bureau, 1 Champion Avenue, Avenel, NJ 07131. It is listed as record #930625, "144 Genuine Sound Effects" and includes creaking doors, thunder, the surf, horses neighing, phones ringing, bugle calls, and even bedlam in a cuckoo clock shop. Another record set, #S44217, has the complete Orson Welles' "War of the Worlds" Broadcast for $5.99. The tapes listed on page 8 are four track and require special equipment that can handle such recordings.

The opportunity to develop the mental skill of visual imagery is not afforded the TV generation as it was children who listened in rapt attention and visualized the unfolding story during the radio era. Reading involves evoking visual imagery on the part of the reader. Effective reading comprehension requires visualizing skill. It is a skill that can be developed and is important not only in reading, but in creative processes.

OLD TIME RADIO

Jim and Marian Jordan ("Fibber McGee and Molly")

NBC Radio was America's first network with its initial broadcast from the Grand Ballroom of the Old Waldorf—Astoria Hotel on November 15, 1926. Old time radio fans have collected the recordings of many of the old broadcasts; one collector has over 2800 programs.

Some of the places where you can secure recordings of early radio broadcasts:

A M TREASURES
P. O. Box 192
Babylon, New York 11702
(Catalogs, $1.00 non-refundable)

RADIO SHOW TIME, INC.
Box 8109
Merrillville, IN 46410
(Catalog 75¢, refundable)

MAR—BREN SOUND LTD.
P. O. Box 4099
Rochester, New York 14610
(Catalog, 50¢)

McCOY'S RECORDING, INC.
P. O. Box 1069H
Richland, WA 99352
(Catalog, $2.00 refundable)

For the serious hobbyist there is even a quarterly devoted to those who trade recordings:

NATIONAL RADIO TRADER
c/o Phil Cole
1539 Deception Road
Anacortes, WA 98221
($8.00 per year includes one free ad per issue.)

Type 3 Activities:

1) Collect different types of paper. Investigate the different types of sounds you can make. Differentiate the sounds. Report your results.

2) Prepare a "radio show" and broadcast it school-wide over the public address system.

3) Visit a radio station to find out how sound effects are made today.

4) Write radio announcers of various stations. Explain what you are doing and invite them to come in and watch or participate.

5) Write some famous people from Old Time Radio, including Orson Welles. Ask them to relate their personal experiences.

6) Write for catalogs of early radio broadcasts. Order one or two as a class. Listen to it. Record what you visualize.

TOPIC: PAPER BAG SKELETONS

SAMPLE COPY
Please share with others

GIFTED/TALENTED
EDUCATION

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Vol. 1, No. 2 MAY 1976

GIFTED/TALENTED Education
Edited by Rudolph Pohl, Ed. D.

SATURDAY CONFERENCE

Put talented teachers together with gifted children on a non-school day and what do you get———The Saturday Workshop. Hundreds of children enjoy classes in areas of their interest. An opportunity to see them in action was made available by the Gifted Child Society at a conference held May 1st.

Six and seven year olds were getting in the spirit of "76" by listening to historical stories, dipping candles, and making clay marbles. Five and six year olds were making needlepoint dinosaurs in another "class." Other five and six year olds listened carefully to Aaron Copeland's musical composition, "Billy the Kid", for the timpani which is the signal for gunshots. They act out the ballet in costume and then discuss the reasons for the insanity of William Bonner. A seven year old researched the biography of Billy the Kid.

Older children were sketching their versions of plans for a home in an architecture class. Others were involved in using the computer, rocketry, using a bicycle wheel to understand why the earth doesn't tip out of orbit, dissecting frogs, or doing creative writing regarding UFO's. Enthusiasm and enjoyment seemed prevalent in the youngsters.

Educators from at least three states gathered to share knowledge about gifted children. Ms. Elizabeth Brotman shared teaching techniques (to be included in a future issue of GIFTED/TALENTED EDUCATION) with the audience. Several mini-workshops met individual needs of the participants. Ms. Gina Ginsberg provided the summary session with indications on how to secure funds from industry and business.

For information about future workshops, contact Ms. Gina Ginsberg, Gifted Child Society, 59 Glen Gray Road, Oakland, New Jersey, 07436. Phone (203) 337-7058.

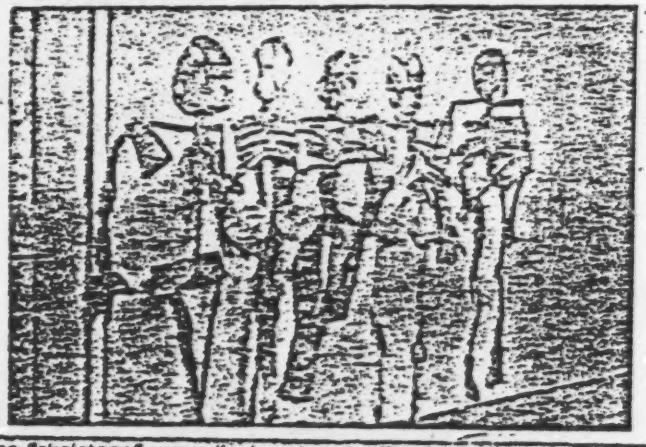
Ms. Carol Sterling, former teacher with the Saturday morning program of the Gifted Child Society, is helping to create a unique baseball pageant with students from the Bronx High School of Science. *Photo and story on page 8.*

PAPER BAG SKELETONS

by Linda Freid, Art Teacher
Birney and Olney Elementary Schools
Philadelphia, Pa.

We made paper bag skeletons in class, and they're terrific! The major objective in making paper bag skeletons of ourselves was to learn what the human skeleton looks like ...

Secondly, we tried to learn the scientific names of the major bones in our bodies and used this knowledge to compare ourselves to skeletons of early man and other animals, with regards to posture, length of limbs, overall body length, and structure of head.



These "skeletons" were displayed at the T.A.G. Regional Conference in Philadelphia, March 28, 1976.

The children used their skeletons to compare their physical structure with that of their brothers and sisters, mothers and fathers. Some of the children also compared their skeletons to their pets. This type of activity led to further interest in anthropology, our original topic in our Academically Talented class. We researched other areas, such as animal behavior, and how physical structures determine behavior.

One budding first grade anthropolcgist studied his skeleton and the pictures he had drawn of his cat, and announced that 'Man is vertical in structure and cats are horizontal.'!

112

Paper Bag Skeletons

A. Purpose in project
1. Can be used in anthropology unit to show structure of human skeletons and to compare this structure with that of the structure of early men
2. Can be used in biology unit

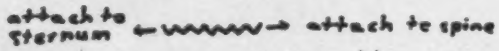
B. Materials
1. Brown shopping bags(grocery) - about 5 to 7 per child
2. Tape measure - a metric measure adds still another dimension to unit
3. Staples and stapler for hindge joints
4. Pencil
5. Paper fasteners for ball-and-socket joints
6. Biology books or encyclopedia on bones or skeletons to determine scientific names of bones
7. White paint or chalk to color skeleton(optional)

C. Work Schedule
1. Skeletons take about one month to complete as described; additional activities lengthen construction time
2. May be constructed in any amount of space
3. Students need to work with a partner for measuring portion of project
4. May be constructed individually

D. Procedure

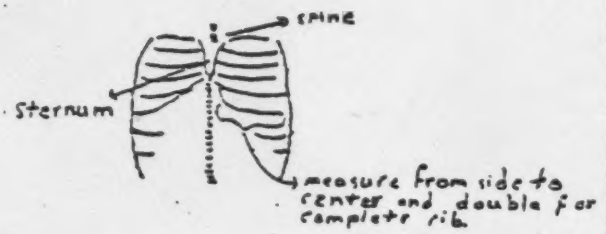
Here are the steps in constructing a skeleton that each child should follow carefully:

1. Shopping bags or brown wrapping paper should be used for all bones. They are lightweight, durable, make an authentic looking skeleton, and are very easily obtainable.
2. Working in pairs, measure the length and width of the vertebrae(spinal column). Cut the bottom from one bag, and cut a slit down the side of the bag, so that a big piece of the bag remains. Draw the spine using the proper measurements. Be sure to draw the "bumps" on the spine.
3. Measure, draw and cut the clavicle.
4. Measure, draw and cut the sternum.
5. Attach the clavicle to the sternum with staples.
6. Take a piece of scrap paper, about ½" wide and 2" long. Fold it many times over so that it resembles an accordian.

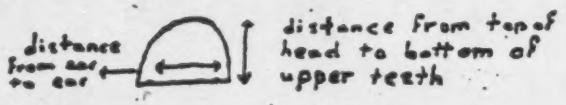


Glue or staple one end of the folded paper to the spine and the other end of the folded paper to the sternum so that the sternum will have a 3-dimensional look.

7. The next step is to construct a rib cage. Breathe in and count the number of ribs. Feel the shape of each rib. If desired, verify the number, shape, and size of ribs in a book. Measure the distance from the sternum to the side and double that number for each rib. Measure the width of the rib and draw the ribs on a bag. Repeat this procedure for each rib.



8. With staples attach each rib to the sternum and vertebrae. (Attach one end of each rib to the sternum, the other end to the vertebrae.)
9. Measure the height of the pelvic bone. Measure the distance of the hip to the center of the body. Draw each pelvic bone according to this height and width. Cut out both pelvic bones and attach to spinal column with staples.
10. Measure upper arms, draw, cut out, and attach to clavicle with paper fasteners.
11. Measure length and width of lower arms, draw, cut out, and attach with staples. (Younger children will probably only draw, cut and attach one lower arm).
12. Trace shape of wrist onto bag and cut out. Attach to lower arm with staples.
13. Measure length and width of thumb and 4 fingers. Draw bones, feeling fingers. Cut bones from paper, and attach with staples. (Young children may only want to trace their whole hand.)
14. Measure length and width of femur. Draw, cut out and attach to pelvis with fasteners.
15. Measure area of patella. Draw, cut out, and attach with staples to femur.
16. Measure length and width of lower leg bone(s), draw, cut and attach to patella. (Again, young children may only want to draw and cut one lower leg bone.)
17. Trace foot onto brown paper. Cut out and attach to lower leg bone. Toes may be done seperately, if desired.
18. Measure distance from top of head to bottom of upper teeth. Measure distance from ear to ear. Draw skull based on these measurements.



19. Measure size of eyes, nose and cheeks. Cut holes in maxilla the appropriate sizes.

20. Measure length along jaw line. Draw jaw, cut and attach with staples, or fasteners, for a "moving jaw".

21. Paint white or color with white chalk if desired.
22. Label each bone with the scientific name.

Type 3 Activities:

1) Develop a Bone Bingo game. Cut boards from oak tag and put names of bones and related words on them. To play, call out clues, and place markers on the words that answer the clue. The first player with a row full yells "Bones!"

2) Soak chicken, turkey, beef bones in vinegar to remove the calcium. Compare.

3) Have students soak teeth in types of soda. Compare results with that obtained with vinegar and animal bones.

4) Make skeletons of animals based on pictures from books or based on experiences with pets.

5) Play Simon Says, "Touch Your Patella..."

6) Compare the bones of the skeleton. Group them according to type or function.

7) Research the number of bones there are in each part of the body. Compare that with the number in the body of various animals. Graph the results.

8) Research the difference among a break, a sprain, and a fracture. Report your results to the class.

TOPIC: HOLIDAY ACTIVITIES

HOLIDAY ACTIVITIES THAT STRESS THE CREATIVE OR DIVERGENT RESPONSE

HOLIDAY QUIZ

Make up a fun holiday quiz with such examples as:

> What's the difference between a candy cane and a gumdrop?

Tell the children it's a quiz, but that there are no right answers. Encourage them to give unusual, different, aesthetically-pleasing answers.

THE LAST TREE/A SICK REINDEER

Give the following writing assignments:

> How would it feel to be the last Christmas tree left on the lot?
>
> If you were one of the reindeer and had to stay at the North Pole because you had the flu, how would you entertain yourself?

A DIFFERENT KIND OF TREE

Do an art lesson on stylized Christmas trees. On the blackboard draw a few trees that are not the traditional shape to help students get the idea. Tell them they can be as "far-out" as they like. Use scraps of construction paper and tin foil to decorate the trees. After the trees are done, ask the students to write a paragraph telling about their trees.

FLUENCY

Write ten holiday sentences on the board. Example:

> Charlie Brown chose a little tree.
>
> small, minute, tiny, diminutive, modest

Underline one word in each sentence. Have the students copy the sentences and list as many synonyms as possible for words.

Other examples:

When Juan decorated his Christmas tree, it was very pretty.

lovely, beautiful, breathtaking, outstanding, gorgeous

The Grinch stole Christmas.

took, snitched, appropriated, purloined, grabbed

We use a dreidel for our Chanukah game.

activity, recreation, amusement, merriment, simulation

Santa's helpers are elves.

aides, toymakers, workers, assistants, associates

ASSOCIATIONS

What do we associate with Christmas? Name as many as you can.

Santa Claus	church	wreath
Christmas tree	presents	candy cane
decorations	star	mistletoe

What do we associate with both Christmas and Easter?

candy
vacation from school
church

What do we associate with Christmas, Easter, and summer vacation?

no school

Continue with 4, then 5 things. See how far the students can go.

HOLIDAY MOBILE

The idea is to make your mobile as unusual as you can. Have students bring in small pieces of wood, small branch, hanger, anything else they want to use as a base. Have them cover it, spray paint it, or leave it plain. Use colored construction paper, tin foil, scraps of cloth, yearn to make and decorate shapes to hang on the mobile. IDEAS: hang by category(transportation), etymology (all acro- words), use(items given as gifts), etc.

DISCUSSION TOPICS

Young People Take Over Old Neighborhood

Make It a Better Place To Live

New York, N.Y.—How would you like to live on a street filled with garbage? Or a street with blocks and blocks of burned-out buildings and empty lots?

You probably wouldn't like it very much. You might even want to do something to change things.

That's how a small group of young people here felt. They shared a dream. They wanted their neighborhood cleaned up. So they decided to do something about it. The first thing they thought they should do was fix up an old burned-out apartment building.

But there were a few problems. One was that they didn't own the building. Another was that the group had no money to buy paint, cement, and all the other building supplies needed. All they really had was their dream and the sweat of their own hard work.

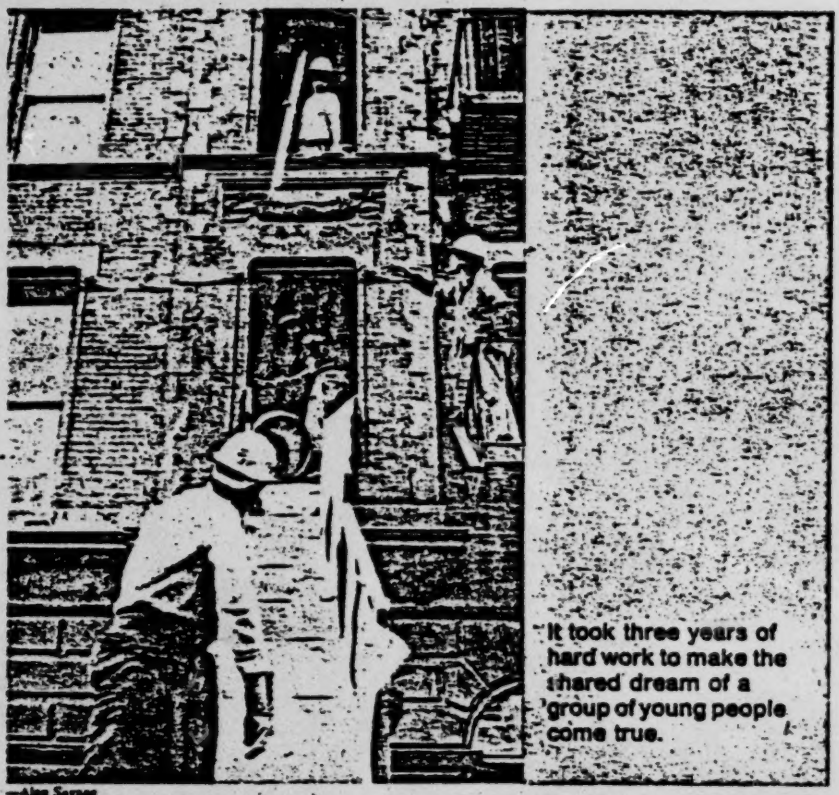
Answers to Problems

To find answers to their problems, they got in touch with New York City's government. The city agreed to lend the group the money. And the group promised to repay the city with rents from the apartments when the building was finished.

So the group of 12—whites, blacks, and Puerto Ricans—went to work. They worked eight hours a day, six days a week. It took three years to finish.

They had to learn to plaster, put up walls, put in toilets, and much much more. But they rebuilt Apartment Building 519. Now the group owns and runs it.

The young people's dream caught on. There are now five other buildings in the same block being rebuilt by other groups of people who care about the neighborhood. They're getting help from the city the same way the first group did.



It took three years of hard work to make the shared dream of a group of young people come true.

—Alan Sorage

Sports

One-Armed Teen Wins Fight To Play Football

New York, N.Y.—Larry Carbone loves to play football. He began getting ready for the fall season last summer. He ran a couple of miles each day and worked on his blocking by hitting a tree in his backyard.

"He hit that tree so often," said his mother, "I began to worry that the tree might not make it until football season."

The tree did make it and so did Larry. Soon after school began, Larry tried out for his school football team.

He had no trouble making the team. In fact, he was so good that he was named starting guard and captain of the team.

The season opened and Larry proved the coach was right in starting him. He played in the team's first two games and in each game showed he was one of the best linemen on the field.

Stopped from Playing

Then suddenly Larry couldn't play anymore. The team doctor wouldn't let him. The doctor decided there was too much chance that Larry would get hurt.

You see, Larry had only one good arm. He was born with the lower part of his left arm missing. The doctor was afraid he might hurt his good arm.

But not everyone agreed with the doctor. "He's the best lineman on the team," said the school's coach. "If he has a handicap, you would never know it."

But the school had to follow the doctor's orders. So Larry was forced off the football team.

But that wasn't the end of it. Larry, his parents and others fought to get the doctor's ruling changed. Finally they got the good news. The head doctor of the city's schools decided Larry should be allowed to play.

That was what Larry wanted to hear. Now he could keep working toward his dream. His dream is to play for the pro football Green Bay Packers someday.

Larry had to practice alone until the doctor's ruling was changed.

—New York Daily News

Science

Looks May Not Be Able To Kill, But...

Some people stare to show who's boss.

New York, N.Y.—Have you been stared at lately? Some people like to stare. They find someone interesting to look at. Then they keep staring until the other person stares back.

A lot of staring often takes place in school—especially right after school starts. Boys stare at girls. Girls stare at boys. Teachers may stare at both.

Scientists are finding there is more to staring than meets the eye. Some people stare to show who's boss. Others may stare to learn more about a person. But no matter why someone stares, most people don't like to be stared at.

Want proof? Try this simple game. Two people sit and stare at each other. The one who looks away first loses. The one who loses probably likes to be stared at the least.

Two scientists in New York tried another kind of staring experiment. They wanted to find out what people really felt inside when stared at. Some men and women were hired to ride on a train. Their job was to stare at the passengers.

—H. Armstrong Roberts

Babies enjoy being stared at by their mothers.

Felt Dislike

Altogether, 55 passengers were stared at. When the train stopped, the people who had been stared at were asked to help those who had stared at them. Some were asked to help lift a bag off the train. Some were asked for directions. Others were asked for help in getting off the train. Only 18 out of the 55 agreed to help. The others felt a strong dislike for the people who had stared at them.

Why do people dislike being stared at? There is no simple answer. But scientists think it is something people learn as they grow up.

Babies Stare

Shortly after birth, babies stare at their mothers. They enjoy having their mothers stare back. It makes the babies feel safe and loved. When the mother talks to the baby or changes the look on her face, the baby often smiles.

But as the baby gets older, things change. The growing baby learns that the look on Mother's face can also spell bad news—he has done something wrong. Now when the mother stares at the child, the child may feel guilty and turn away.

The child may react the same way when stared at by others. To him a strong look may say, "You have done something wrong."

That's what the fellow on the opposite page seems to be saying. Not just to children but to adults too. Most people feel that they can do without those kinds of looks.

New York Page of Lists/Stephanie Bernardo

FOOD AND DRINK INVENTED IN NEW YORK

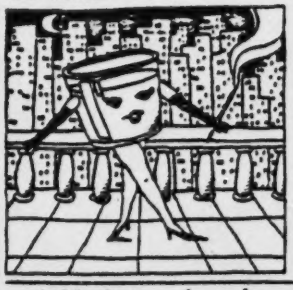
"...The modern frankfurter was born in Coney Island in the 1890s. Charles Feltman sold them from a pushcart for 10 cents each..."

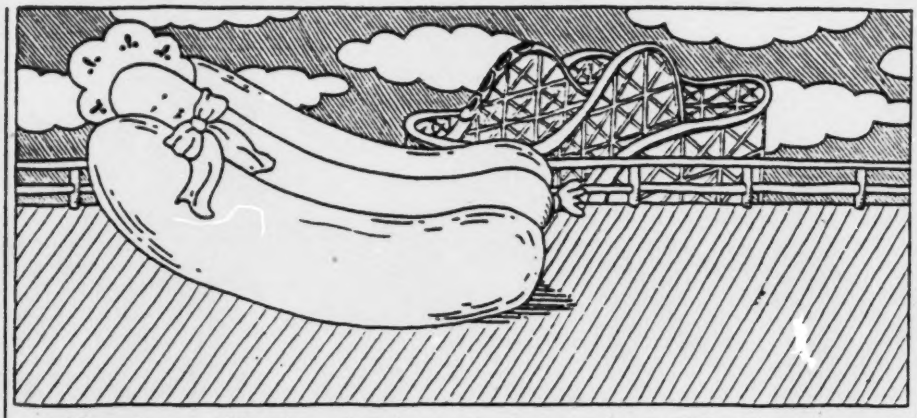
Chicago is hog butcher to the world, but these nationally beloved dishes and drinks with style and class were, of course, invented in New York. To wit:

1. Waldorf salad: This invention was Oscar Tschirky's (Oscar of the Waldorf), who served as the Waldorf-Astoria's maitre d'hôtel from 1893 to 1943. He was the first to combine apples, celery, lettuce, and mayonnaise, but someone else later added chopped walnuts to his recipe. Waldorf salad has been made with nuts ever since.

2. Bronx cocktail: Made with gin, dry vermouth, sweet vermouth, and orange juice, the Bronx cocktail was named for our borough in 1919.

3. Manhattan cocktail: This drink of bitters, sweet vermouth, and whiskey was named after the Manhattan Club in New York City, where it was first mixed in the 1870s.

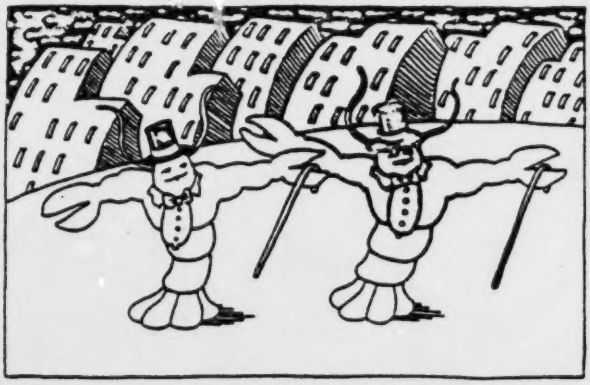




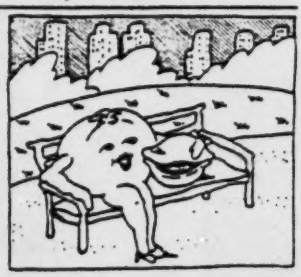
5. Hot dogs: Although frankfurter sausages have been around for centuries, the modern frankfurter was born in Coney Island in the 1890s. It was there that Charles Feltman, a native of Frankfurt, Germany, first sold 10-cent frankfurters in toasted rolls from a pushcart. Feltman's frankfurters were extremely popular, and at the prodding of Jimmy Durante and Eddie Cantor, Nathan Handwerker decided to open his own stand and undersell his former boss by a nickel. Nathan opened his stand in 1916 at Surf and Stillwell avenues in Coney Island, and his sales have been increasing every year. Today there are Nathan's in the cities and the suburbs, but most people seem to agree that the hot dogs always taste best at Coney Island.

6. Lobster Newburg: It was at Delmonico's again that this dish was first served. Ben Wenberg, a seafaring friend of Charles Delmonico's, had just returned from a voyage to South America and insisted on showing Charles the method of preparing lobster that he had learned there. Delmonico decided to name the mixture of lobster, heavy cream, egg yolks, cognac, and sherry in honor of Ben, and for a time the dish was called lobster à la Wenberg. When the two later had an argument, Delmonico changed the name of the dish on Delmonico's menus and renamed it lobster Newburg.

7. Vichyssoise: Although this dish was invented by a Frenchman and has a French-sounding name, vichyssoise is strictly American. Louis Diat, a chef at the Ritz-Carlton Hotel in New York, first concocted this cold leek-and-potato soup in 1910 to meet a demand for cool, refreshing summer dishes.



4. Manhattan clam chowder: Unlike its New England cousin, this clam chowder always includes tomatoes and never calls for milk. It is considered a heresy by many New Englanders. The Maine legislature once actually went so far as to introduce a bill which would outlaw the mixing of clams and tomatoes.



8. Baked Alaska: The original Delmonico's Restaurant, founded in 1827 by Peter and John Del-Monico, was responsible for the dessert's present form and fame. The dish of ice cream on a pastry base with meringue was invented by chef Charles Ranhofer to commemorate the 1867 purchase of Alaska. ■

Illustrated by Steve Henry

"We won't be left out anymore! And we won't be left behind!"

Who's talking? Ms. Jancy Campbell. Ms. Campbell works with a group made up of only left-handed people.

Why have a special group for lefties? Ms. Campbell says it's because left-handers face problems right-handed people never even think about.

Most tools and machines are built for use by right-handers—like scissors and power saws. Why? Because most people are right-handed. So companies make products that most of their users can use.

These products can cause problems for lefties. Some companies won't hire a left-handed worker for certain jobs. Why? Because the machines used on the jobs were built for right-handers.

MS. CAMPBELL'S group and other left-handed people are working to right these wrongs. Left-handed people have started their own companies. They make products just for left-handers.

But Ms. Campbell and her group are not the only ones interested in which hand a person uses. So are scientists.

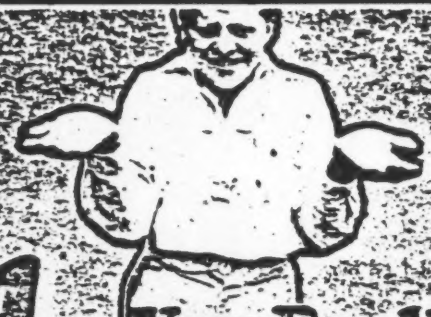
Scientists have studied left-handers for many years. Here are some things they've learned:

- Left-handers are often better in sports than right-handers. They may draw better and come up with more and better ideas.
- Suppose the parents in a family are both left-handed. Chances are their children will be lefties too.
- Most people are not only left- or right-handed. They are right- or left-eyed and footed too. They depend on one eye and foot more than the other.

THE tests at the right can tell you if you are left or right footed, eyed, and sided. Or even a mixture. Some people are. Try each one. See if you are right—or left.

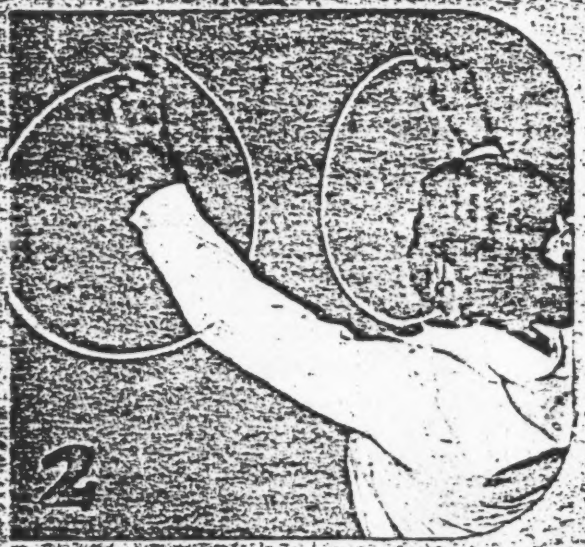
Left-Handers No Longer

Many new products are made just for left-handed people.



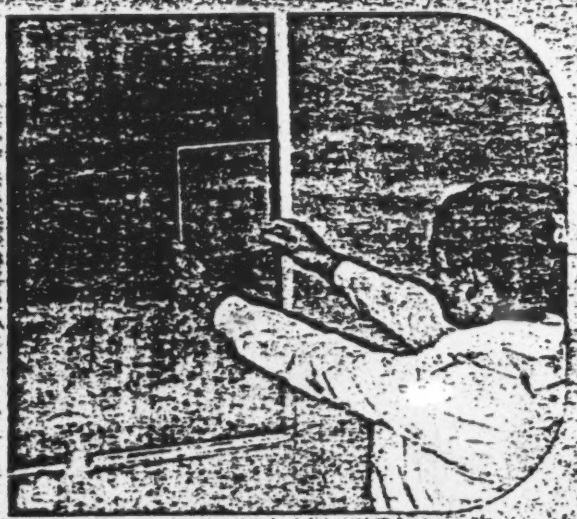
Are You Really A Righty... Or a Lefty?

Put a ball or paper cup on the floor. Stand back 10 feet. Walk or run up to the cup and kick it. Do this more than once. If you keep kicking with the right foot, you are right-footed. The left foot means you are probably left-footed.



Get paper and two pencils. Or use two pieces of chalk on the board. Hold chalk in both hands. Draw two circles at the same time with your two hands. If one hand draws its circle clockwise—in the same direction the hands on a clock move—you may be left-sided.

Left Behind



Draw a big dot on the board. Stand 10 feet away. Punch a small hole in some paper. Hold the paper away from your body. Look at the dot through the hole. Use both eyes. Now move the paper toward your face. Keep watching the dot. Which eye did the paper end up in front of? That's your strong eye.

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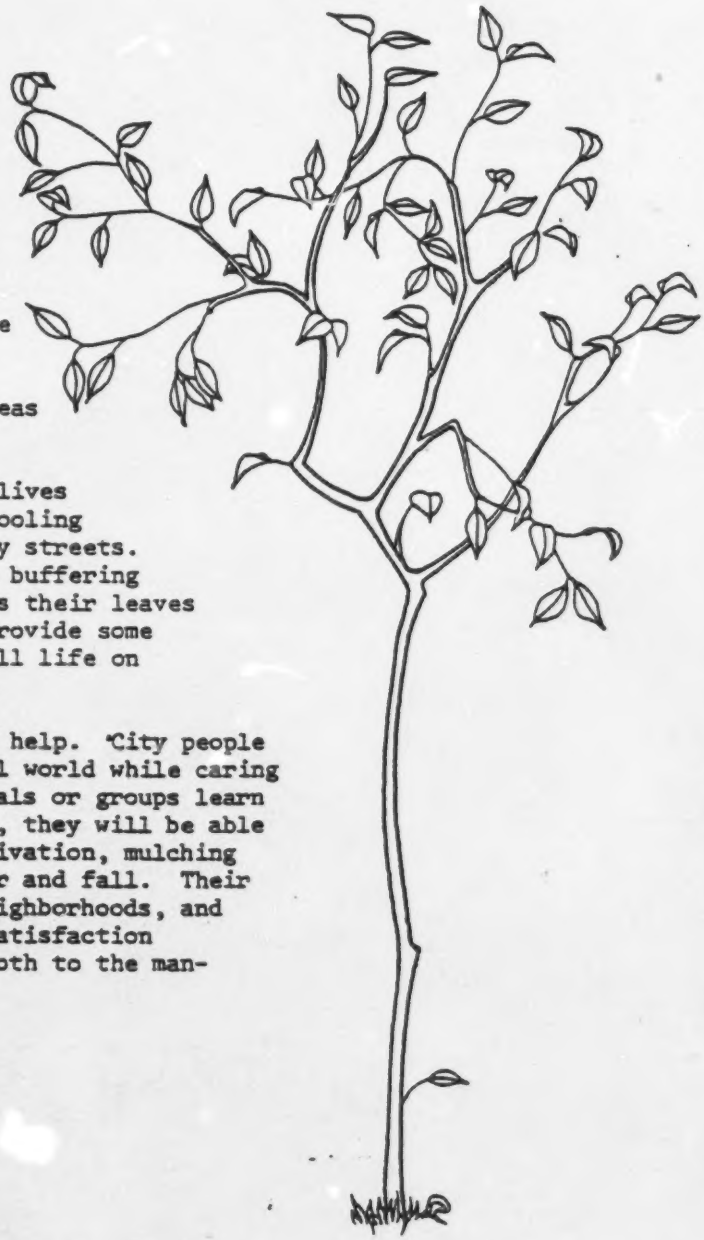
"SOMETHING FOR THE TREES...SOMETHING FOR THE CITY"
A Guide to Accompany the Film



INTRODUCTION

The "urban forest"-- or the "forest of the streets"-- is being recognized at last. No longer does the word "forest" automatically mean a vast expanse of tree-covered land that is remote from the metropolitan centers where most people live. "Forest" is now a word that includes the millions of park and street trees in urban and suburban areas all over the nation.

Street trees are crucial to the lives of city people. They bring beauty, cooling breezes, and welcome shade to our city streets. They are our environmental helpers in buffering noise and filtering air pollution. As their leaves "breathe" (transpire), they help to provide some of the oxygen that is necessary for all life on our earth.

Our valuable city trees need our help. City people can develop a kinship with the natural world while caring for these living things. As individuals or groups learn the rudiments of botany and tree care, they will be able to carry out a simple program of cultivation, mulching and watering during the spring, summer and fall. Their efforts will help to improve whole neighborhoods, and those who participate will have the satisfaction of knowing that they are of benefit both to the man-made and natural environments.

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ORGANIZING FOR STREET TREE CARE

Almost anyone can devise a plan for the regular care of street trees. The plan may range from a simple, individual routine to a more ambitious block, neighborhood, or even city-wide effort.

1. Individuals can care for street trees in front of their houses or on their blocks. Such citizen action is easy: it requires no organizational effort other than the scheduling of one's own time. And if individual routine care becomes apparently beneficial, the activity has a good chance of spreading to neighbors who will surely notice the improvement in the health and appearance of their community.

   Encouraging individuals to care for trees must always be a goal, even when there is a larger, more organized program. Given the nature of volunteer work, it will be impossible to guarantee the uninterrupted care of every street tree. Thus, individual responsibility for regular tree care is essential.

2. Individuals can help organize their block association or neighborhood civic association to provide for street tree care. Special groups, such as those connected with clubs and religious organizations, may also develop a volunteer tree care project. Most groups find that tree care is one of the most enjoyable and rewarding activities a group can undertake.

3. An organized tree care project may begin under the auspices and guidance of a city agency, horticultural society, or botanic garden. This type of project is especially valuable, since expert help will readily be available. And citizens who participate may be able to receive sophisticated training in order to provide more extensive tree care.

4. Citizen groups that are tightly organized, and have the ability to raise money for an on-going project, may want to start a "Tree Corps" of adults, young people, and children that will be paid to care for trees during the spring and summer. Funds may be available from "youth corps" grants under Federal and State auspices, from private foundations, or from corporate gifts. A "Tree Corps" may be disbanded for winter, or, during that season, may carry on with indoor lessons stressing botany, horticulture and neighborhood environmental concerns. It is essential that a project of this scope have an on-going director, salaried if possible.

5. School classes or clubs are excellent groups to undertake an on-going tree care project. In addition to encouraging the study of ecology and botany, such a project guarantees regular care of trees around the school itself and on the surrounding blocks. A school project also provides excellent opportunity for students to interact with adult members of the community that may be involved in tree care.

HOW TO CARE FOR STREET TREES

The film "Something for the Trees...Something for the City" and this guide are designed to help citizens take care of most of the routine matters that affect trees. If a tree has a special problem, phone or write appropriate city agencies, horticultural societies, botanical gardens or environmental groups. You may feel free to duplicate this guide for distribution.

PROBLEMS	SOLUTIONS
Litter. Many people seem to look upon tree pits as litter baskets. If too much litter piles up around street trees, moisture will be prevented from entering the soil and percolating to the roots. Litter also makes tree pits unsightly and attracts insects and other pests.	Clean around street trees regularly, as often as needed. This may be done as often as once a day.
Dogs. Many unthinking persons allow their dogs to use trees as bathrooms. The acid in the urine can eat holes in the bark, opening the way for possible insect infestation and decay. The tree pit soil can become saturated with poisons if too much dog excrement is deposited on it. As a result, the tree may die.	Don't let dogs use trees as bathrooms. Urge dog owners to train dogs to use gutters. Tactfully explain to dog owners that trees need protection from dogs. Post signs as reminders.
Packed Soil. The soil in a tree pit can become packed down hard enough so that it cracks. Hard, packed soil makes it almost impossible for young trees to receive needed rainwater. In addition, air can't get to the tree's roots, thus causing damage that may ultimately lead to the death of the tree.	Cultivate (loosen) soil in tree pits regularly, to a depth of two inches. Don't dig too deeply as this might injure small roots near the surface. Tree pit soil must be kept loose and porous. After cultivation, cover the soil with a mulch of organic material such as wood chips, rotted plant clippings and leaves, nut shells or grain hulls.
Punctures. Tree bark can be damaged by careless people who drive nails or thumbtacks into it, carve initials on it or pierce it with bike chains. Such wounds in the bark open the way for insects and diseases that may cause decay under the bark.	Urge friends and neighbors to avoid tree bark damage. Paint any wounds with tree wound dressing. (See equipment and materials list)

PROBLEMS	SOLUTIONS
Poisons. Careless or uninformed people sometimes dump oil, gasoline, or detergents into tree pits. Salty water from sidewalk de-icing in winter may flow into the pits. All of these substances are poisonous to tree roots. Eventually they may cause the death of trees.	Urge car owners not to dump gasoline, used crankcase oil and carwash detergents into tree pits. Don't use rock salt for de-icing sidewalks in winter. Use calcium chloride or sand instead.
Dehydration. Trees need plenty of water during the growing season. This is especially true of younger trees that are just getting started. The hot, dry months of summer present major problems for young trees. The roots try to grow under hot sidewalks and the soil may become hard-packed. Lack of water and air often kills the roots of young trees.	Cultivate the soil regularly. Water trees during the hot, dry months. Water deeply so that roots will not come to surface. Use 6-8 buckets of water twice a week, or put a gently-running hose into the pit for approximately half an hour.
Wire Girdling. Trees can be damaged or killed from support wires that are left on too long. Newly planted trees need the support of wires and stakes. But after a year or two, as trees expand their growth, the wires may become very tight. They may cut through the vital inner bark and cambium layers, thus stopping growth and circulation, and eventually killing the tree.	Loosen the supporting wires around the tree after one year. Some trees are large and strong enough by this time to have wires and stakes removed. If you leave the wires and stakes on, watch the tree's growth carefully. Remove wires when they begin to cut into the tree trunk.
Damage to Trees and Pits from Cars. People often damage or knock down trees as they park their cars. Probably the most common loss of street trees comes from cars and trucks hitting and uprooting them.	Whenever possible, install strong, heavy tree guards around the edge of the tree pit (Don't put guards around the tree itself because, as the diameter of the trunk increases in size, the tree will outgrow the guard.) When you drive a car, be especially careful as you park near street trees.
Sucker Growth. At times, trees will support "suckers" on their lower trunks. "Suckers" are small, short branchlets with leaves. They suck some of the needed sap from the bark before it can reach the growing crown of a tree.	Prune suckers regularly. Most of them can be broken off with your hands. Others may require shears. It is usually not necessary to paint the wounds left after sucker removal.

PROBLEMS	SOLUTIONS
Major Damage to Trunks and Heavy Upper Limbs. Street trees often sustain major damage, including complete uprooting or breaking of large upper limbs. Volunteer citizen groups usually don't have the equipment or expertise to deal with these problems.	Experts from proper city agencies, a private tree care company, or botanical garden staff must be called in. Do Not attempt to deal yourself with heavy branch damage or a completely uprooted tree.

EQUIPMENT AND MATERIALS YOU WILL NEED

For a regular program of tree care, you will need the following equipment and materials:

1. Cultivating tools--hand cultivators (forks), shovels, trowels.
2. Plastic bags or other containers for litter and debris.
3. Mulch of organic materials--wood chips, plant clippings, leaves, nut shells, grain hulls.
4. Hose or pail for watering.
5. Small pruning shears for cutting off suckers.
6. Tree wound dressing or "tree paint". This is special paint. Buy it in a nursery or other garden store. Use the can with the brush attached to the lid. Do Not use an aerosol spray can. Be Careful when you use this compound. Wear old clothes, since it is very difficult to get tree wound dressing out of clothing. It will not hurt the skin, and comes off with soap and water.

The necessary equipment is not expensive. It can be donated in small amounts by individuals. Organized groups may raise funds to buy equipment and materials. Merchants may contribute what is needed as a community service. It may also be possible to borrow tools and other necessary items from city agencies, horticultural or botanical groups, or environmental organizations. The group can even make its own mulch by saving plant clippings and leaves and allowing them to rot over a period of months to form an organic mold.

FOR FURTHER INFORMATION

The film and the teacher/leader guide have been researched and developed by the Environmental Action Coalition. EAC, a non-profit, tax-exempt organization, conducts education and action programs concentrating on tree care, energy conservation, and solid waste, recycling and resource recovery. The organization regularly publishes Eco-News for upper elementary children, the Environmental Education Bulletin for New York area teachers and group leaders and The Waste Paper for citizens interested in issues related to solid waste and resource utilization. (more...)

In the field of tree care, in addition to this film and guide, the Environmental Action Coalition has developed a teaching unit, "Green Spaces in City Places," two issues of Eco-News on trees and tree care, and a book Caring For Trees on City Streets, published by Charles Scribner's and Sons. For further information about the care of street trees, or about any of EAC's materials or programs, contact the Environmental Action Coalition at 156 Fifth Avenue, Suite 1130, New York, N.Y. 10010. The telephone number is (212) 929-8481.

The film, "Something for the Trees...Something for the City" (16mm, color, 14 mins. 20 secs.) is available from the Environmental Action Coalition for sale at $185. Contact Association Films for short term free loan.

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MORE ANALYSIS SKILLS *

WEEK OF NOVEMBER 1 — ANALYSIS SKILL: isolate

Tuesday (Practice) — Isolate the word that doesn't belong.

lion leopard lemon elephant

Wednesday (Practice) — Isolate the character that doesn't belong.

Cinderella Snow White Christopher Columbus

Thursday (Practice) — Isolate the number that doesn't belong.

2 3 5 10

Friday (Integrate) — Isolate one fact, idea, or character from your reading or study this week and explain its importance.

WEEK OF NOVEMBER 7 — ANALYSIS SKILL: order

Monday (Practice) — Put these words in alphabetical order.

biology zoology archaeology

Wednesday (Practice) — Put these events in chronological order

the opening of school
the election of Ed Koch as mayor
Halloween

Thursday (Integrate) — Take five events or occurences from your own life and put them in order of importance.

WEEK OF NOVEMBER 14 — ANALYSIS SKILL: group

Monday (Practice) — Take the following items and put them into groups. Explain your grouping.

lemon	lime	lion	line	circle
orange	octopus	square	squid	cheetah

Tuesday (Practice) — Group these historical events. Explain your groups.

astronauts land on the moon
Columbus comes to America
the Vietnam War
the impeachment of Richard Nixon
the election of Jimmy Carter
the assassination of Abraham Lincoln

*PROCESS

Wednesday (Practice) — Group these words. Explain your groups.

biology	geography	autograph
zoology	biography	geographer
botany	autobiography	biographer

Thursday (Practice) — Group the following:

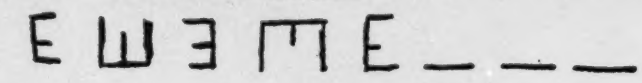
boat	taxi	helicopter
subway	train	bicycle
car	airplane	tricycle

Explain the groups.

Friday (Integrate) — Using the members of your class, how many ways can you group the class? Explain your groupings.

WEEK OF NOVEMBER 21 — ANALYSIS SKILL: pattern

Monday (Practice) — Figure out the pattern and complete it.



Tuesday (Practice) — Figure out the pattern and explain it.

2,4, 3, 5, 4,6, 5, 7.....

Wednesday (Practice) — Complete the pattern.

a,a,b,b,b,c,a,a,b,b,b,c,a,__

WEEK OF NOVEMBER 28 — ANALYSIS SKILL: take away

Monday (Practice) — Take away one letter from our alphabet. Explain how that would affect us.

Tuesday (Practice) — Take away one of our numerals. Explain how that would affect our number system.

Wednesday (Practice) — Take away those things which a baby cannot play with.

rattle	matches	scissors	paste
clown	pacifier	ball	doll

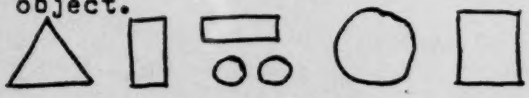
Thursday (Practice) — Take away the types of transportation you have never used.

car	bus	plane	boat	cable car
taxi	subway	helicopter	monorail	motorcycle

Friday (Integrate) — Take one of the stories you have read. Take away one of the characters. Explain how the story would be different.

WEEK OF DECEMBER 5 — ANALYSIS SKILL: arrange

Monday (Practice) — Arrange these shapes to make an object. Name your object.



Tuesday (Practice) — Arrange the following people:

greatgrandfather
son
grandson
grandfather

Explain your arrangement. (MAKE SURE THE STUDENTS ARE AWARE THAT THERE IS MORE THAN ONE ANSWER. THE ANSWER ITSELF IS LESS IMPORTANT THAN THE JUSTIFICATION OR EXPLANATION.)

Wednesday (Practice) — Arrange these pictures for placement on a wall.

Thursday (Practice) — You have several things to do after school. Arrange your schedule to include the following:

go shopping
go to the bank
pick up dry cleaning
buy a record

(DISCUSS WITH STUDENTS WAYS OF ARRANGING: BY TIME, LOCATION, IMPORTANCE, ETC.)

Friday (Integrate) — Choose activities, projects, or other work you have done this week at school. Arrange them in some way. Explain your arrangement.

WEEK OF DECEMBER 12 — ANALYSIS SKILL: relate

Monday (Practice) — Relate the following people, places, or things to each other. Explain the relationship.

hydrogen and oxygen
ice, water, and steam
Christopher Columbus & Neil Armstrong
Margaret Walker and Emily Dickinson
Crete and Cuba
oxygen and carbon dioxide
pollution and carbon monoxide
apple and zebra
knife and gnat
fish and deer

Tuesday (Practice) — Relate biology, psychology, zoology. Explain the relationship. Can you relate other words to the three above?

Wednesday (Practice) — Make a diagram to show how each member of your family is related to the others.

Thursday (Practice) — How are the following things related? (1 word)

watch clock
calendar sun dial

Friday (Integrate) — Take a story or book you have read. Relate the story or book or one of the characters in it to a TV program or recent movie. Explain how they are related.

WEEK OF DECEMBER 19 — **ANALYSIS SKILL: take apart**

Monday (Practice) — Take apart a pencil. List the parts and explain how the pencil was put together.

Tuesday (Practice) — Take apart the word ANTIDISESTABLISHMENTARIANISM. Examine each part(prefixes, root, and suffixes). Figure out the meaning by examining each part of the word.

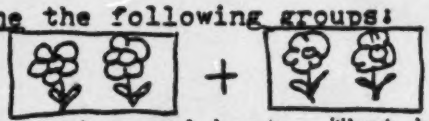
Wednesday (Practice) — Take apart the following picture. Group the parts.

Thursday (Practice) — Take apart your day. Examine and label the parts.

Friday (Integrate) — Take apart a story you have read. Choose one part of the story. Explain how that part affects the whole. (Example: In Cinderella, how does the part in which the fairy godmother appears affect the story?)

WEEK OF JANUARY 3 — **ANALYSIS SKILL: combine**

Tuesday (Practice) — Combine the following groups: What's the result?



Wednesday (Practice) — Combine water and heat. What happens?
ice and heat

Thursday (Practice) — Combine the following colored paints: What results?

blue paint and yellow paint
red paint and white paint
blue paint and red paint
red paint and yellow paint

WEEK OF JANUARY 9 — ANALYSIS SKILL: distinguish

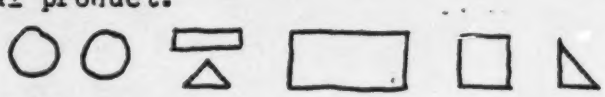
Monday (Practice)	Distinguish between: cat and kitten a gas and a solid TV and radio A and a -5 and +5 addition and multiplication
Tuesday (Practice)	Distinguish sleepiness from exhaustion immoral from amoral fact from opinion proof from hypothesis
Wednesday (Practice)	How do you distinguish Santa Claus according to appearance? How do you distinguish Peter Pan? Another character?
Thursday (Practice)	In what ways do we distinguish objects from one another? (GET PICTURES OR EXAMPLES TO ILLUSTRATE SIZE, SHAPE, COLOR, THICKNESS.)
Friday (Integrate)	Pick two characters from a story you have read. Distinguish them from each other according to personality traits or behavior in the story.

WEEK OF JANUARY 16 — ANALYSIS SKILL: divide

Tuesday (Practice)	Divide the number 10 into 2 groups. How many are in each group?
Wednesday (Practice)	List all the types of transportation you can think of. Divide the list into those you have used and those you haven't. Divide those groups into transportation you like and transportation you don't. Divide those groups again into transportation that is cheap or free and transportation that is expensive.
Thursday (Practice)	Name all the animals you can think of. Divide them into the following categories: MAMMALS, FISH, BIRDS, REPTILES, AMPHIBIANS, INSECTS.
Friday (Practice)	Explain how the following are divided: a day — people — a decade a year — minutes — a century

WEEK OF JANUARY 23 — ANALYSIS SKILL: put together

Monday (Practice)	Put together the following shapes. Explain the final product.



Tuesday (Practice) — Put together the following words to make a new word:

fire place
dragon fly
summer time
tree top
bottle cap

Wednesday (Practice) — Put together all the toys you can think of that begin with T or B.

Thursday (Practice) — Put together all the objects that ever hurt you.

Friday (Integrate) — Put together all the characters from your reading that share the same quality or characteristic(for example, the ability to make other people feel good, or the ability to keep working until they finish or find a solution).

WEEK OF JANUARY 30 — ANALYSIS SKILL: Dissect

Monday (Practice) — Dissect this flower.

Tuesday (Practice) — Take an object of your choice and dissect it. Explain your dissection.

Wednesday (Practice) — Take the story of Cinderella and dissect it according to plot, setting, character, point of view, theme, etc.

Thursday (Practice) — Take the human body and dissect it(in your mind) according to the various systems: circulatory, digestive, nervous, etc.

Friday (Integrate) — Take a character, object, story, idea and dissect it. Explain your dissection orally or in written form(words or pictures).

A WORD ABOUT PRODUCT

The choice of products for gifted/talented students is vast. It includes preparation of plays and performances, newspapers, radio and television shows, photographic exhibits, greeting cards - the choice is unlimited.

What is more important than the product itself is the fact that it is a high-quality, higher level product, a product commensurate with the students' abilities, depending on experience and age.

Two products prepared by IGC classes in the district recently are excellent examples of differentiated products for the gifted/talented: "Santa and Star Wars," an original production done by Nancy Salvo's third grade IGC class at P.S. 57, and the hand-made Christmas cards done by Ana Amáez's fifth-sixth grade bilingual IGC class at P.S. 155. Compliments to the respective teachers and classes!

Merry Christmas!
Happy Chanukah!
Feliz Navidad!